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ABSTRACT

This study was designed to develop a series of instructional modules to teach inservice teachers the Flanders System of Interaction Analysis. Instructional modules were constructed based on research information, and then modified from feedback from experts and random trials. Two field-test groups were used to provide data for validation testing, and 16 performance or behavioral objectives were developed. The authors judged that the performance standards established by all the behavioral objectives were met. These objectives included the ability of the teacher to recognize the purpose of interaction analysis; classify from memory selected verbal interaction using the Flanders System at a 90 percent level of accuracy; identify selected situational variables; apply the ground rules for classifying and recording interaction activities; record classroom verbal interaction at 3-second intervals; transfer original recordings to an interaction analysis matrix with no more than 5 percent error; accurately determine the number of tallies per column on the matrix; calculate the percentage of tallies in a column as related to the total, the percentage of teacher talk, the percentage of direct and indirect teacher talk, and the percentage of pupil talk; and identify and interpret the meaning of matrix areas. Details of the nine sessions and the evaluation instrument are included. (MBM)

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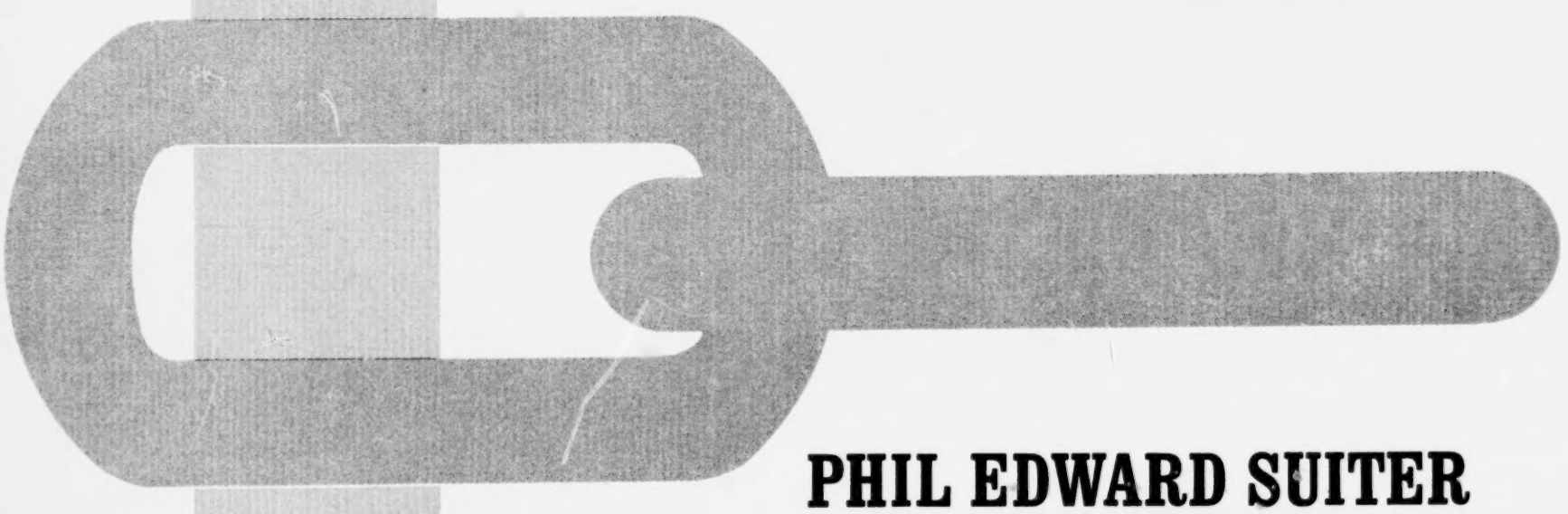
RATIONALE, DEVELOPMENT, AND VALIDATION OF A SERIES OF SELF-INSTRUCTIONAL MODULES IN INTERACTION ANALYSIS



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FOREWORD

This monograph reports the development of a self-instructional kit for the Flanders System of Interaction Analysis. It is the first in a planned series of designs to report attempts by the Appalachia Educational Laboratory, Inc. to conceptualize, implement, and evaluate a new approach for providing inservice education in the context of an *Educational Cooperative*.

The purpose of this monograph is to provide the professional community with the results of a developmental process employed in the development of the kit which was different in design from that generally utilized for experimental research. It was different in that criterion measurement as opposed to norm measurement was employed. It was different in that the data were collected under "clinical" conditions that required a very high level of rapport to be established between the developers and the target population. The design was also different in that data analyses were uncomplicated, even to the point of appearing simplistic. And finally the study was directed toward a "product" -- a kit whereby a teacher could learn to evaluate his or her own verbal behavior.

The kit was composed of a manual and a set of tapes. A copy of the manual is included in the appendix. The tapes are not included for obvious reasons.

Another monograph reports the results of a large field test of this kit conducted in Tennessee in the Tennessee Educational Cooperative. This field test was conducted during the second semester of the 1967-68 academic year. The kit was used in subsequent activities of the Tennessee Cooperative during the 1969-70 academic year. Still another monograph is planned to report the results of a field test conducted in Ohio during the second semester of the 1967-68 academic year.

James T. Ramsey

PREFACE

The development of this package was a joint project by the authors to construct an instrument designed to teach the classroom teacher how to analyze the verbal behavior in the classroom. The system of Interaction Analysis, as described in this package, was developed by Ned Flanders at the University of Minnesota.

Even though the authors recommend that this instrument become a part of a formal preservice or inservice education program, the materials are so designed that a single teacher may develop the same knowledges and skills. Under any circumstance, the teacher should spend at least ten to twelve hours working with the materials to insure the development of a thorough understanding of the technique and the benefits that may be derived from its use.

This project was undertaken at the request of Dr. Patricia O'Riley and Dr. James T. Ranson of the Appalachia Educational Laboratory of Charleston, West Virginia.

The authors wish to express thanks to the many classroom teachers who cooperated in the field testing of these materials.

Phil E. Suiter
Bernard Queen

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CHAPTER I

INTRODUCTION

Among educators in the public schools an intense concern exists about the adequacy of the preparation offered prospective teachers through existing teacher education programs. The logic of the concern is that the real substance of professional education for teachers has been only partially identified. That which is identified all too frequently has little relevance to performance in the classroom. This leads to the conclusion that a large number of teachers who are currently teaching in public schools have little, if any, contact with recently developed techniques that define and study teaching performance skills.

This conclusion may be explained in part by the practice of structuring teaching education programs on what appears to be a logical approach without reference to an adequate understanding of the ways teachers actually perform in the classroom, and the absence of feedback from classroom teacher behavior. Improvement in the preparation of teachers then is likely to be proportional to the success of efforts to relate the content of preparation programs to teaching performance skills.

But this is not the extent of the problem. An improvement in the teacher education programs may better prepare prospective teachers, but it does little for the teachers now in the classroom. Some attention needs to be given to inservice programs that improve teaching performance skills.

For inservice teacher education, however, it is apparently easier to identify a problem that exists than it is to devise a plan of attack leading to a solution. One major difficulty is the identification of those aspects of teaching performance skills that can become a base for studying classroom performance. Smith has stated:

> "The question of what knowledge is relevant to the control of teaching behavior is an empirical one, because teaching is a natural social phenomenon. It has its own forms, its own constituent elements, its own irregularities, and its own problems. It takes place under a stable set of conditions--time limits, authority figures, systems of knowledge, social structures, psychological capacities, etc. If we would understand teaching and thereby gain control over it, we must first study it in its own right." [1]

If this position can be assumed to be valid, it seems very reasonable to believe that these aspects of teaching performance skills can be identified, observed, and the possible effects analyzed through research techniques. On this basis it is also reasonable to conclude that the inservice teacher can be helped to measure his own teaching performance skills with the goal of becoming a more effective teacher.

Problem

The need for new approaches to inservice education is widely accepted. This need is partially created by the assumption that preservice education is the end of teacher preparation when, in fact, a more valid assumption is that preservice education is the beginning of teacher preparation. The dilemma exists partly because of the lack of methods for studying teacher behavior and subsequently relating teacher behavior to pupil learning. One result is too many failures experienced by teachers. These failures no doubt have their effect on pupil learning.

Interaction analysis provides a ray of hope for solving this acute problem. The technique can be used as an effective means of objectively assessing the inservice teachers' classroom verbal behavior. It can be used in the absence of outside assistance. One simply records a live classroom session on a tape recorder and with interaction analysis skills an in-depth analysis can be conducted. If a successful means can be developed for making interaction analysis accessible to inservice teachers, an important step will have been taken toward improving inservice education for teachers.

This study is an attempt to take one in a series of steps to meet this need. The first step was to develop a self-instructional kit for interaction analysis. The idea was that the logistics of inservice training would be greatly simplified with a self- instructional kit.

Purpose of the Study

The purpose of this project was to develop a self-instructional program to teach the Flanders System of Interaction Analysis to inservice teachers so that they might examine their own classroom performance through the use of a direct observation technique. The program was built around a series of instructional modules and tapes, each requiring approximately one hour of study time for the learner.

Specifically, the project was developed through two discrete stages; a *developmental stage* and a *validation testing stage*. The developmental stage was characterized by the construction of preliminary sequences in accordance with the most reasonable information available in the research. Modification of the sequences was accomplished after the reaction of a panel of experts and random trials with inservice teachers.

The validation testing included the field test of the program with a sampling of inservice teachers. Evaluation of the effectiveness of the program was made on the basis of objectives that were a part of each instructional module.

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[1] B. O. Smith, Knowledge About Knowledge For Teachers, (Urbana: University of Illinois, 1961), p. 13. (Mimeographed.)

Logic of the Study

There seems to be no more obvious approach to the study of the teaching process than the direct observation of teachers while they perform in the classroom. Yet it is only recently that such direct observation has become a part of research studies designed to explore the teaching act. Typically, research on teaching has been limited to a study of the antecedents and consequents of actual classroom performance.

The role of direct observation in research on teaching seems to be as a means of learning something about the teaching process and its relationship to pupil achievement. Teacher effectiveness then would ultimately be determined in terms of the effects on pupils, more specifically in terms of desirable changes in pupil behavior. Thus it can become theoretically possible to distinguish between effective teaching and less effective teaching in terms of the effects on pupil learning.

Descriptive studies of teaching attempt to conceptualize the complex phenomenon of teaching. These studies suggest an ordering of the various elements or components of teaching and thus offer cognitive maps for trying to understand the phenomenon. Such maps can be the result of direct observational techniques rather than derivatives from fields which may or may not have relevance to the phenomenon of teaching. Instead of emphasizing knowledge which one may think a teacher will need in order to teach effectively, direct observation permits an analysis of teaching acts as they occur in spontaneous classroom interaction.

Observational techniques are presently being developed to obtain reliable and valid measurements of differences in typical behaviors that occur in different classrooms. Medley and Mitzel maintain that the validity of such observational techniques depends on the fulfillment of three conditions: (1) a representative sample of the behaviors to be measured must be observed; (2) an accurate record of the observed behaviors must be obtained; and, (3) the records must be scored so as to faithfully reflect differences in behavior.[2]

The first condition could be easily fulfilled by randomly sampling the behaviors to be measured. To do this it is frequently necessary to combine the data from several observations. The second and third conditions seem to be somewhat interdependent in the sense that how a record may be scored depends upon how it is made.

The task of the observer is to observe events that take place in the classroom and then to record them in scorable form. His crucial function is to serve as an abstractor and to select those aspects of behavior relevant to the scoring process that occurs later. Abstraction is necessary not only because it is humanly impossible to record everything, but because abstraction makes the phenomena understandable. This abstractive function of the observer takes the form of coding behaviors as they are observed and recording them in categories.[3]

The process of selecting the behaviors to be recorded is essentially one of identifying a limited range of behavior relevant to the purpose of the study and of constructing categories or items to be used by the person making the observation. It would seem to be essential that the behaviors be coded and recorded as soon after they occur as possible. Many factors can affect memory and may seriously distort a record made in retrospect.[4]

To summarize, the logic of this study is that an observational technique can be used to measure classroom behavior during which an observer records relevant aspects of classroom behaviors as they occur. This is done within a negligible time limit with a minimum of quantification intervening between the observation of a behavior and the recording of it. Typically, behaviors are recorded in the form of tallies, checks, or other marks that code them into predefined categories and yield information about which behaviors occurred, or how often they occurred, during the period of observation.

Design of the Study

The study included a thorough review of the literature to examine the salient features of interaction analysis as a direct observation technique for quantifying verbal teaching performance skills. A panel of experts comprised of Dr. John Hough, Syracuse University; Dr. N. A. Flanders, University of Michigan, and Dr. James Ranson, Appalachia Educational Laboratory, were consulted for aid in identifying those points that need to be stressed in a self-instructional program. The authors had the advantage of teaching experience with the Flanders System of Interaction Analysis as a part of the undergraduate teacher education programs. With this base, the development of the self-instructional program was carried through successive stages of development and validation.

Developmental Stage

The developmental stage was characterized by the writing of a draft of the program, largely on a trial and revision basis. The panel of experts was asked to react to and further identify the salient features of interaction analysis and to suggest the first sequential arrangement of the self-instructional modules. As the modules took shape, each was sampled to a member of the target population (inservice teachers) for a response. On the basis of this response, the module was modified if required. In a sense, one of the authors served as an editor of the self-instructional module, pointing out ambiguities that called for resolution, indicating difficult points that either required additional development or clarification, and indicating where the material was trivial and uninteresting.

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[2]Donald M. Medley and Harold E. Mitzel, *Measuring Classroom Behavior by Systematic Observation, Handbook of Research Teaching* (Chicago: Rank McNally and Company, 1963), p. 250.

[3]Ibid., p. 258

[4]Ibid., p. 251

This process of testing and revision was pursued until the point was reached at which additional change did not appreciably alter the form of the modules.

One important function of this stage was to interpret and observe as the modules were reviewed by classroom teachers. This requires keen sensitivity to subtle indications of problems, discerning gaps, unpredicted confusions, overgeneralizations, or even the failure to generalize during the presentation.

In addition, the classroom teachers were asked to advise on such variables as logical sequence, size of the segments or sessions, amount of practice, reading level, and quality of the writing. This feedback was interpreted and the module revised accordingly.

VALIDATION TESTING STAGE

The data collected in the developmental stage tended to be "clinical" in the sense that they were the result of close observation of, and interaction with, individual members of the target population. Data collected in the validation testing stage, however, were more descriptive of the performance characteristics of the self-instructional modules. This stage was carried out with two field groups of classroom teachers who were representative of those for whom the modules were designed. Members of the field test groups were accepted on a volunteer basis with an attempt made to secure representative participants from all grade levels of the public school program. Each of the field test groups consisted of a minimum of six and a maximum of fifteen participants.

The format of the first field trial consisted of ten one-hour sessions. At each session the written context or tapes developed were presented to the members of the test group without comment. After a sufficient study period, a short objective examination based on the content of that segment to which they had been exposed was administered to the test group. The test group then was free to discuss any aspect of the materials presented with the developers of the program segment. The entire discussion was taped for further analysis.

The objectives of the first field trial were:

1. To gain immediate feedback from a test group representative of the people for whom the program is designed concerning reading level, use of technical terms, the quality of the writing, sequence, size of segments, and the amount of practice.

2. To gain immediate feedback concerning the achievement of the test group relative to the objectives for each session.

3. To gain suggestions from the test group on the improvement of the techniques employed.

The format of the second field trial consisted of ten one-hour work sessions with the self-instructional program revised on the basis of feedback data from the first field trial. This time questions from the participants about the subject matter content of the materials presented were *not* entertained. In no way was the written text supplemented.

However, following the work sessions, participants were asked to submit written suggestions for the improvement of the materials. Verbal suggestions were again recorded on tape for future analysis. The group was also asked to make judgments of achievement in terms of the objectives for each session. Those judgments were also recorded on tape.

At the close of the final session, an objective test designed in terms of the previously established objectives and covering the entire program of materials was administered. The test was designed to sample the cognitive knowledge of the Flanders System of Interaction Analysis achieved by the second field test group.

The specific objectives of the second field test group were:

1. To determine if the program as developed will teach a cognitive knowledge of the Flanders System of Interaction Analysis.

2. To determine if the training tapes will serve as tools to enable classroom teachers to develop an acceptable level of skill in taking interaction analysis.

3. To gain additional feedback on reading level, use of technical terms, quality of the writing, sequence, size of segments, and the amount of practice.

4. To gain additional feedback for improving the techniques used in the self-instructional program.

Examinations, written suggestions, and taped discussions were analyzed and the program revised in accordance with these findings.

As stated earlier, the purpose of this study was to develop a self-instructional program for teaching classroom teachers a cognitive knowledge of the Flanders System of Interaction Analysis. The success of this endeavor was determined by the achievement of the participants in the second field trial. Achievement was judged by specific criteria. As a result of exposure to the self-instructional program teaching the Flanders System of Interaction Analysis, participants in the second field test group should:

1. Be able to recognize the purposes of interaction analysis when stated on an objective examination.

2. Be able to classify from memory selected verbal interaction using the Flanders System of Interaction Analysis at a ninety percent level of accuracy.

3. Be able to identify selected situational variables that should be noted prior to taking interaction analysis.

4. Be able to apply the "ground rules" for taking interaction analysis.

5. Be able to record classroom verbal interaction at 3-second intervals or at a rate of between 17 and 22 categorizations per minute.

6. Be able to transfer original recordings of verbal behavior to an interaction analysis matrix with not more than five percent error.

7. Be able to determine accurately the total number of tallies per column on the matrix.

8. Be able to calculate the percentage of tallies in a column of the matrix as related to the total tallies on the matrix.

9. Be able to calculate the percent of teacher talk that is direct and the percent of teacher talk that is indirect as related to total teacher talk.

10. Be able to calculate the percent of teacher talk as related to the total number of tallies on the Matrix.

11. Be able to calculate the percent of pupil talk as related to the total number of tallies on the matrix.

12. Be able to calculate the ratio of indirect teacher talk to direct teacher talk.

13. Be able to calculate a revised indirect-direct ratio.

14. Be able to identify and interpret the meaning of the following areas of the matrix:

a. steady state cells
b. transitional cells
c. content cross
d. extended indirect influence
e. extended direct influence
f. teacher response to student talk
g. student talk following teacher talk
h. silence or confusion

15. Be able to identify patterns or models of verbal behavior as recorded on a matrix.

16. Be able to make at least five hypotheses about the verbal interaction that is pictured on any given matrix and support these hypotheses with specific references to the matrix.

Theoretically, there is a third phase to the development of self-instructional materials, the extension or utilization phase, that is endless. It should occur every time the materials are used in the field, even under widely varying conditions. While this phase was not specifically a part of this proposal, it should be emphasized that continuous modification of the materials based on field data is necessary to keep the program updated.

Attempts to Measure Classroom Climate

The area of classroom behavior that has received the greatest attention by researchers using direct observation techniques is that of "classroom climate." The emphasis here moves away from the intermixture of facts and interpretations that seemed to characterize the use of rating scales. Rather it represents an attempt to keep the data independent of the observers within a narrow range of area.

Flanders has developed a very promising technique for observing classroom climate.[5] The Flanders system is unique in that it preserves a certain amount of information regarding the sequence of behavior. This is also the first system that is simple enough to permit an observer to gather data, and in a reasonable period of time have the data in a final form that can be analyzed and studied easily. This feature would enable an individual classroom teacher to tape record a period of classroom verbal interaction and analyze his own verbal behavior by simply replaying the tape while making a record of the recorded behavior.

Flanders has termed his system Interaction Analysis. Developed to record only verbal behavior, ten categories were used to clarify the statements of the pupils and the teacher at a rate of approximately every three seconds. Observers can be trained to categorize with sufficient accuracy and thus closely examine teaching performance skill. This method of observation can be used to quantify the qualitative aspects of verbal communication. The entire process becomes a measure of teacher influence on the assumption that most teacher influence is expressed through verbal statements, and that most nonverbal influence is positively correlated with verbal.

Much of the research in the past several years directly relevant to the problem of improvement of instruction has been done with the specific use of Flanders System of Interaction Analysis as an observation tool. Results of the research indicated that pupils of teachers who were observed to be indirect, as quantified by the use of interaction analysis, had more positive attitudes toward the

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[5]N. A. Flanders, Teacher Influence, Pupil Attitudes, and Achievement (Minneapolis: University of Minnesota, U. S. Office of Education Coop Res. Project No. 397, 1960.) (Mimeographed)

school, the teachers, and toward other pupils than did pupils of those teachers who were identified by observers as direct. This conclusion supports the validity of interaction analysis as a tool for studying teaching performance skills.

The historical development of the Flanders System of Interaction Analysis is relevant for this study since it is a technique built on several other pieces of significant research.

One of the early concerns of systematic observation was expressed by Thomas:

> . . .The problem seems to be. . .to find means of recording the particular stimuli in the uncontrolled environment to which a given individual, at a given moment, reacts overtly--what consistency is observable in his selective responses over a period of time and what variability is shown among different individuals. [6]

The past few years have witnessed a distinct upsurge of activity in the area of teacher behavior and its effect on classroom climate and ultimately its effect on pupil achievement. Recently several systems for classifying and analyzing classroom interaction and behavior have been devised and studied. Results of these labors have provided considerable material for much discussion within educational circles. Moreover, the emerging implications for investigations into the possibility of a classroom teacher studying his own behavior out of a concern for improvement are voluminous.

During the late thirties and early forties, H. H. Anderson and his colleagues designed and conducted longitudinal studies involving five different teachers of preschool, primary, and elementary children.[7,8] These studies were based on observations of "dominative" and "integrative" teacher behaviors called *contacts*. Several pertinent and interesting findings emerged from these studies.

First, the dominative and integrative behavior patterns of the teachers were observed to spread throughout the classroom. In other words, it is the behavior of the teacher more than any other single person who sets the climate for classroom activities and interaction. Dominative teacher behavior incites dominative pupil behavior and integrative teacher behavior incites and nurtures integrative pupil behavior.

Second, a particular type of behavior developed in a given classroom continues even when the teacher is not in the room. Moreover, the same characteristic behavior pattern persists in a given teacher's classroom the following year, even with different pupils.

Third, students whose teacher exhibits a higher proportion of integrative contacts show more spontaneity and initiative, voluntary social contribution and acts of problem solving.

Fourth, students whose teacher exhibited a higher proportion of dominative contacts are more easily distracted from school work, and show greater compliance to as well as rejection of teacher dominance.

About the same time, Lippitt and White conducted experiments which probed into the effects of an adult leader's influence on boys' groups in a non-classroom atmosphere.[9] The findings supported and reinforced the earlier studies of Anderson. However, in one sense, these studies extended Anderson's notion of "conforming to teacher domination." There emerged a new concept of "dependence on the teacher." Here group members became unable to proceed in the absence of teacher direction.

Later on, Withall combined the major findings of Anderson *et al.* and Lippitt and White into a seven-category index designed to assess the social and emotional climate of a classroom.[10]

Summary

The problem of this study is twofold. First, there is widespread assumption that preservice education is the end of teacher preparation when, in fact, it can also be validly thought of as the beginning of teacher preparation. Second, there is a dearth of ways for studying teacher behavior. These two factors, conflicting assumptions and lack of ways for studying teacher behavior, are the main ingredients of the problem underlying this study.

The purpose of this study was to develop a self-instructional program for teaching interaction analysis. The justification for this purpose was that its achievement would result in a way for studying teacher behavior and this subsequently could alleviate some of the conflict between the two conflicting assumptions.

The logic of the study was that a systematic observational technique—Flanders System of Interaction Analysis—can be used to measure classroom behavior thus providing an operational definition for the study of teacher behavior.

The design of the study called for a developmental and a validation stage. The developmental stage was characterized by the writing of a draft of the program, largely on a trial and revision basis. The validation stage was the terminal stage of development, the result of which was the product being developed. Behavioral objectives a la Mager were used as criteria for development and validation.

Finally, this chapter presented a synopsis of the research culminating in the development of the Flanders System of Interaction Analysis.

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[6] Dorothy Thomas, *Some New Techniques for Studying Social Behavior*, Child Development Monograph, 1929, pp. 1-3.

[7] H. H. Anderson, *The Measurement of Domination and of Socially Integrative Behavior in Teachers' Contacts with Children*, Child Development, 1939, Vol. 10, pp. 73-89;

[8] H. H. Anderson and J. E. Brewer, *Studies of Teachers' Classroom Personalities, II: Effects of Teachers' Dominative and Integrative Contacts on Children's Classroom Behavior*, Psychological Monographs, 1946, No. 8 and No. 11.

[9] R. Lippitt and R. K. White, *The Social Climate of Children's Groups*, in R. G. Barker, J. S. Kounin and H. F. Wright (eds.) Child Behavior and Development (New York: McGraw-Hill Book Company.)

[10] J. Withall,, *The Development of a Technique for the Measurement of Social-Emotional Climate in the Classroom*, Journal of Experimental Education, 1949, Vol. 17, pp. 347-361.

CHAPTER II

A REVIEW OF RELATED LITERATURE

While the act of teaching has been overtly discussed with varying degrees of authority for many years, a systematic approach toward gaining understanding of the nature and complexities of teaching had just begun to appear in the literature. Conceptions concerning the teaching act consisted largely of scattered ideas, theoretical speculations, opinions, folklore, and untested assumptions about the function of the teacher in a classroom setting. It appeared to be a truism that fields of human endeavor had developed only as research provided empirical knowledge that might serve as a foundation on which to build. But research in teaching seemed not to have reached a point where an adequate understanding is available. Therefore, there was no one accepted theory of teaching to be found in the literature.

Early Attempts to Measure Teacher Effectiveness

Early attempts to measure teacher effectiveness probably grew out of a dissatisfaction with existing methods of supervision and took the direction of trying to identify patterns of teacher behavior which were assumed to be related to teacher effectiveness. Most such attempts were based on the use of rating scales to examine teacher personality characteristics. While there were many attempts to use this technique, most have been uniformly unsuccessful in yielding measures of teaching skill.

Hellfritzsch, in a study completed in 1945, stated that "teacher rating scales . . . are only slightly related to observed pupil growth. . . ."[1] This conclusion was supported by Anderson who says ". . . no appreciable relationship exists between rating criteria and pupil attainment criteria."[2]

The fact that early ratings of teacher effectiveness showed little relationship to pupil achievement did not necessarily mean that effectiveness cannot be measured in process. It may be assumed that whatever effect a teacher has on students must result from his behaviors. It then becomes only necessary to identify the crucial behaviors, record them, and interpret them properly to measure effectiveness in process.

There was a glimmer of success in this respect in two studies reported by Jayne in 1945.[3] Sound recordings were made of lessons taught by 38 teachers and then transcribed for analysis. Behaviors were recorded into a total of 184 categories but later 100 of the items were discarded becaused they were used so infrequently by the teachers involved in the study. While specific simple items did not correlate with outcomes, it was possible to combine items into "indices" which did correlate with outcomes.

Single items may have appeared somewhat trivial by themselves. When a few of them were put together, however it was possible to see a common factor in the items that may not have been so trivial and that were correlated with teacher effectiveness. This study served to illustrate that it was possible to identify at least some behaviors that differentiate classrooms of teachers of varying levels of effectiveness by the use of objective observational techniques.

David Ryans completed a major study that dealt with a classification system for teaching skills in 1960.[4] This study aroused considerable interest, but the classification system employed such gross terms that it failed to provide the concepts around which a theory of teaching might be constructed. After a study of these types of research attempts, Getzels and Jackson concluded:

> Despite the critical importance of the problem and a half-century of prodigious research effort, very little is known for certain about the nature and measurement of teacher personality and teaching effectiveness. The regrettable fact is that many of the studies so far have produced only pedestrian findings. For example, after the usual inventory tabulation it is said that good teachers are friendly, cheerful, sympathetic, and morally virtuous rather than cruel, depressed, unsympathetic, and morally depraved. But when this has been said, not very much that is especially useful has been revealed. For what conceivable human interaction--and teaching is first and foremost a human interaction-- is not better if people involved are friendly, cheerful, sympathetic, and virtuous rather than the opposite? What is needed is not research leading to the reiteration of the self-evident, but to the discovery of specific and distinctive features of teacher personality and of the effective teacher.[5]

Within the past ten years there was a significant change in the direction of educational research that dealt with a study of teaching. The focus of inquiry became what actually happens in the classroom with attempts being made to describe through direct and systematic observation what a teacher does and how he behaves while teaching.

Since interest in descriptive research was initiated, several studies have involved the development of instruments for the study and analysis of classroom per-

[1] A. G. Hellfritzsch, *A Factor Analysis of Teacher Abilities*, *Journal of Experimental Education*, XIV (1945), 199.

[2] H. M. Anderson, *A Study of Certain Criteria of Teacher Effectiveness*, Journal of Experimental Education, XXIII (1954), 67.

[3] C. D. Jayne, *A Study of the Relationship Between Teaching Procedures and Educational Outcomes*, Journal of Experimental Education, XIV (1945), 101-134.

[4] D. G. Ryans, Characteristics of Teachers. (Washington, D. C.: American Council on Education, 1962).

[5] J. W. Getzels and P. W. Jackson, *The Teacher's Personality and Characteristics*, Handbook of Research on Teaching, ed. N. L. Gage (Chicago: Rand McNally, 1963), p. 574.

formance. The result was that there are now available a variety of instruments for analyzing teaching performance skills. Most of these instruments for studying teacher performance were first used as research tools. Yet each of the instruments tended to reflect the authors' philosophical and psychological point of view. Each of the instruments has an implied theory of instruction that might be deduced from a study of the instrument.

There appeared to be a major assumption underlying the research into teacher behavior. It was that an increased understanding of the processes of teaching can be gained by the technique of direct observation in the classroom. Systems of classification developed thus far in the literature may be grouped into three general categories:

(1) those dealing with the psychological climate of the classroom or classroom interaction;

(2) those dealing with attempts to measure classroom behavior in purely quantitative terms; and

(3) those dealing with substantive objectives or cognitive aspects of teaching-learning. While recognizing that there was a considerable degree of overlap in these classifications, the major emphasis of this chapter was given to the first category.

Studies of Psychological Climate

The early attempts to describe the role of the teacher in the classroom resulted in a conceptualization of polarized models, dominative versus integrative, authoritarian versus democratic, teacher-centered versus learner-centered, and direct versus indirect. The studies of Anderson that were cited in Chapter I began a movement devoted increasingly to the identification and analysis of teaching styles that were to be observed in a classroom setting.[6] Lippitt and White conducted experiments that followed a similar pattern to the studies conducted by Anderson by also polarizing teacher behavior in terms of dominative and integrative contacts with students.[7] Dominative and integrative contacts were best understood in terms of the degree of freedom that each type of contact permitted students.

This study required close examination of the practices of the early researchers of dichotomizing teacher behavior into such either/or models as direct versus indirect or authoritarian versus democratic. Teaching was thought to be a very complex phenomenon, subject to a great variety of situational variables that were present in every classroom. These variables may have effected changes in the behavior pattern of the teacher. Implicit to this study was the proposition that the teacher who uses direct or indirect teaching strategies may deviate considerably from these patterns without appreciably influencing outcomes in terms of student learning. What is needed is a further refinement of the criteria for appraising teaching performance in selected situations.

Turner and Fattu state that research which polarizes teacher behavior styles has reached a dead end because negligible relationships exist between these polarizations of behavior and the ultimate criterion of pupil growth along desired dimensions, the immediate criterion of practice teaching marks, and the immediate criterion of rating by a superintendent or a principal.

Barr has drawn the following conclusion:

> The simple fact of the matter is that, after 40 years of research on teacher effectiveness during which a vast number of studies have been carried out, one can point to few outcomes that a superintendent of schools can safely employ in hiring a teacher or granting him tenure, that an agency can employ in certifying teachers or that a teacher education faculty can employ in planning or improving teacher education programs.[9]

Barr further states that teaching is a complex business and that any psychometric approach to the measurement of teaching success which assumes that there are common and stable factors in the teacher and his environment must meet with indifferent success.[10] Mitzel and Gross state that teaching is multidimensional and there are many kinds of effectiveness for different kinds of teachers, programs and situations.[11]

Smith supports the statement of Mitzel and Gross by stating that teaching is a complex activity, although to the uninformed it appears so simple that anyone can do it.[12] One source of teaching complexity is the different types of techniques used for dealing with materials and for dealing with social, intellectual, and emotional climate of the classroom. Few, if any, other occupations involve all these. The teacher handles much hardware, but more importantly, must relate to large numbers of people. These include pupils, colleagues, and laymen in highly significant ways and often at crucial points in their lives. To handle these situations skillfully the teacher needs to be able to command the techniques of social interaction and empathy.

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[6]Anderson, loc. cit.

[7]Lippitt and White, loc. cit.

[8]R. L. Turner and N. A. Fattu, *Skill in Teaching, A Reappraisal of the Concepts and Strategies in Teacher Effectiveness Research,* Bulletin of the School of Education (Bloomington: Indiana University, 1960), Preface.

[9]A. S. Barr et al., *Second Report on the Committee on Criteria of teacher Effectiveness,* Journal of Educational Research, XLVI (1953), 657.

[10]A. S. Barr et al., The Measurement of Teaching Ability (Madison, Wisconsin: Dunbar Publications, 1945), pp. 203-204.

[11]H. E. Mitzel and Cecily F. Gross, *The Development of Pupil Growth Criteria in Studies of Teacher Effectiveness,* Educational Research Bulletin, XXVII (1958), 206.

[12]B. O. Smith (ed.), Teachers for the Real World (Washington, D. C.: AACTE, 1968), p.69.

Most teacher education programs provide little or no training in the skills of teaching or in the skills of social interaction. Instead, such programs consist of courses in the sociology and philosophy of education, learning theory, and human development. They include little opportunity to apply the concepts gained. Jackson states that from a common sense viewpoint, the linkage between teaching and learning is so intimate that an understanding of the one process would seem to imply an understanding of the other.[13] This expectation has enjoyed widespread popularity among psychologists and educators alike. It has bolstered the hope that a scientific theory of learning will be developed that will have immediate and direct consequences for the improvement of the teacher's work. This hope has not been fulfilled, however.

The solution to the problem of estimating and improving the performance of classroom teaching would seem to involve reducing in some way the daunting lists of "competencies" that have recently come from the literature. This author suggests that one approach involves a turning to measures of proficiency in terms of pupil-teacher interaction which Jackson views as perhaps the chief determiner of the psychological climate that characterizes the classroom.[14]

The importance of the variable of pupil-teacher interaction has been recognized by Barr,[15] explicity stated by Hughes,[16] and demonstrated by Gage.[17]

Studies by Anderson,[18] Anderson and Brewer,[19] and Anderson, Brewer and Reed[20] have shown a relationship between types of teacher behavior and extent of growth along certain desirable and attitudinal criteria. These studies described two patterns of teacher-pupil interaction. First is "socially integrative behavior" that encourages the child to be spontaneous, develop his own ideas and engage in harmonious relationships with others. The second is "dominative behavior" in which the child is forced to behave in accordance with the teacher's standards or purposes.

The dominative and integrative contacts of the teacher involved in these studies set the pattern of behavior that tended to spread throughout the classroom, leading Anderson to conclude that domination breeds domination and integration breeds integration. Anderson also found that pupils of teachers with a distinctly "integrative" pattern of contact showed significantly more spontaneity in the form of imitative and voluntary social contributions. They also performed acts of problem solving, and displayed significantly fewer attributes of boredom and conflict with others. Thelen has corroborated these findings by Anderson.[21]

A further refinement of the techniques for assessing the social-emotional climate of the classroom was accomplished by Withall.[22] He developed a continuum that ranged from learner-centeredness to teacher-centeredness for assessing teacher remarks. His categories into which teacher statements could be grouped included learner-supportive statements, accepting and clarifying statements, problem-structuring statements, reproving statements, and teacher self-supporting statements. Withall used his technique by classifying verbal behavior from typewritten transcripts of sound recordings made of classroom interaction.

The work accomplished by Withall and Mitzel previously cited set the stage for the system of interaction analysis that was developed by Flanders.[23] This system is an observational technique which can be used to classify the verbal behavior of teachers and pupils. Using this system, verbal behavior in the classroom is classified into ten category designations. There are seven categories for teacher behavior, four of which are classified as indirect influence. They are (1) accepting pupil feeling, (2) praising and encouraging, (3) accepting pupil ideas, and (4) asking questions. There are three categories of direct teacher influence which are (5) giving information or opinion, (6) giving directions, and (7) criticizing. Two categories of pupil talk are used in the system, (8) pupil response to the teacher and (9) pupil initiated talk. Category 10 is used to indicate silence or confusion. A summary of the categories follows:

SUMMARY OF CATEGORIES FOR INTERACTION ANALYSIS

1. *ACCEPTS FEELING: accepts and clarifies the feeling tone of the students in a nonthreatening manner. Feelings may be positive or negative. Predicting and recalling feelings are included.

[13]Philip W. Jackson, Life in Classrooms (New York: Holt, Rinehart and Winston, 1968), p. 159.

[14]Ibid., p. 161.

[15]A. S. Barr et al., *The Measurement and Prediction of Teacher Characteristics,* Review of Educational Research, XV (1948), 112.

[16]Marie M. Hughes, *Development of the Means for the Assessment of Quality in Elementary Schools* (Provo: University of Utah, 1959), p. 9

[17]N. L. Gage et al., Equilibrium Theory and Behavioral Change (Urbana: University of Illinois, 1960), p. 87.

[18]H. H. Anderson, *The Measurement of Domination and of Socially Integrative Behavior in Teachers' Contacts with Children,* Child Development, X (1939), 73-89.

[19]H. H. Anderson and J. E. Brewer, *Studies of Teachers' Classroom Personalities, I: Dominative and Socially Integrative Behavior of Kindergarten Teachers,* Psychological Monographs, 1945, No. 6.

[20]H. H. Anderson, J. E. Brewer, and M. F. Reed, *Studies of Teachers' Classroom Personalities, III: Follow-up Studies of the Effects of Dominative and Integrative Contacts on Chilcren's Behavior,* Psychological Monographs, 1946, No. 11.

[21]H. A. Thelen, *Experimental Research Toward a Theory of Instruction,* Journal of Educational Research, XLV (1957), 89-93.

[22]John Withall, *Development of a Technique for the Measurement of Socio-Emotional Climate in Classrooms,* Journal of Experimental Education, XVII (1949), 347-261,

[23]N. A. Flanders, Teacher Influence, Pupil Attitudes, and Achievement (Minneapolis: University of Minnesota, U. S. Office of Education Coop. Res. Project No. 397, 1960). (Mimeographed.)

2. *PRAISES OR ENCOURAGES: praises or encourages student action or behavior. Jokes that release tension, not at the expense of another individual, nodding head, or saying "un huh;" or "go on" are included.

3. *ACCEPTS OR USED IDEAS OF STUDENT: clarifying, building, or developing ideas or suggestions by a student. As a teacher brings more of his own ideas into play, shift to category five.

4. *ASKS QUESTIONS: asking a question about content or procedure with the intent that a student answer.

5. *LECTURES: giving facts or opinions about content or procedure; expressing his own idea; asking rhetorical questions.

6. *GIVES DIRECTIONS: directions, commands, or orders with which a student is expected to comply.

7. *CRITICIZES OR JUSTIFIES AUTHORITY: statements intended to change student behavior from nonacceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing, extreme self-reference.

8. *STUDENT TALK-RESPONSE: talk by students in response to teacher. Teacher initiates the contact or solicits student statement.

9. *STUDENT TALK-INITIATION: talk by students, which they initiate. If "calling on" student is only to indicate who may talk next, observer must decide whether student wanted to talk. If he did, use the category.

10. *SILENCE OR CONFUSION: pauses, short periods of silence, and periods of confusion in which communication cannot be understood by the observer.

After a lesson has been categorized by a trained observer, the data collected by the observer must be summarized so that it can be interpreted. This is done by entering the category numbers in the form of tallies into a 10-row by 10-column table called a matrix. The completed matrix gives the observer a picture not only of the percentage of interactions falling into each category but also the general sequence of responses. Although an exact representation of the sequential time element of the entire lesson is not shown, recording the numbers in the matrix in an overlapping fashion preserves the sequential time element of adjacent numbers. Thus, the observer might note that praise followed student response about 10 percent of the total lesson time and yet be unable to extract from the matrix whether the praise occurred during the first or last fifteen minutes of the particular lesson.

The early research in this particular technique of interaction analysis was designed to relate childrens' attitudes to patterns of teacher behavior. Flanders found that pupils of teachers who were observed to be indirect had more positive attitudes than pupils of teachers who were perceived by observers as being direct. These findings indicated that pupils of indirect teachers were more interested in subject matter and liked the methods used by their teachers better than students of direct teachers.[24,25] The results of the early research tend to support the validity of interaction analysis as a procedure for predicting the general attitudes of children in a particular classroom.

The next research effort undertaken by Flanders and his associates was designed to determine the relationship between teacher behavior and student achievement. Several large studies were conducted both in a controlled laboratory setting and in normal classroom situations. These studies were carried out at the junior high level and involved the teaching of social studies and mathematics. Amidon and Flanders found that dependent-prone eighth grade students who were taught geometry by indirect teaching methods learned more than dependent-prone children taught by direct methods.[26]

In a larger study, Flanders isolated, for the purposes of analysis, junior high school teachers whose pupils learned the most and the least after a two-week experimental program in social studies or mathematics.[27] Teachers of the higher-achieving classes were found to differ from teachers of the lower-achieving classes in the following ways:

1. They used five to six times as much acceptance of student ideas and encouragement of student ideas.

2. They used five to six times less direction and criticism of student behavior.

3. They talked ten percent less.

4. They encouraged two to three times as much student initiated talk.

Similar results to those found by Flanders between teachers of high-achieving pupils and those of low-achieving pupils were found by Amidon and Giammateo when they compared 30 superior teachers with 150 randomly selected teachers in elementary schools.[28]

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[24]Edmund Amidon and N. A. Flanders, The Role of the Teacher in the Classroom (Minneapolis: Paul S. Amidon and Associates, 1963), p.56.

[25]Flanders, loc. cit.

[26]Edmund Amidon and N. A. Flanders, *The Effects of Direct and Indirect Teacher Influence on Dependent-prone Student Learning Geometry*, Journal of Educational Psychology, LII (1961), 286-291.

[27]Flanders, loc. cit.

[28]Edmund Amidon and Michael Giammateo, *The Verbal Behavior of Superior Teachers*, The Elementary School Journal, LXV (1965), 283-295.

Since all of this research appeared to have implications for teacher education, Flanders instituted an inservice program in which interaction analysis was taught as an observational tool. The inservice program was able to effect observable changes in teacher patterns of verbal behavior. In general, at the end of the experimental inservice program, these teachers evidenced more encouraging and accepting behavior and were less critical and more indirect than they had been at the beginning of the experiment.[29]

Kirk conducted a study with student teachers in elementary education in which he taught interaction analysis to an experimental group and compared this group with student teachers who received no interaction analysis instruction. He found that the experimental group talked less, had more pupil-initiated talk, and more often accepted pupil ideas than student teachers in the control group.[30] Zohn found that student teachers who learned interaction analysis developed more positive attitudes toward student teaching than did a control group of student teachers who were not taught interaction analysis.[31]

Little research has been done on the training of supervising teachers and their direction of teachers. However, the recent work of Medley and Mitzel,[32] and Zohn,[33] does suggest that there is a relationship between the behavior and attitudes of supervising teachers and improvement in student teaching. While they found that the effect of the college supervisor on the student teacher was slight, the influence of the supervising teacher and the classroom situation appeared to be great.

Amidon conducted a study at Temple University in which the major hypothesis compared those student teachers who had learned interaction analysis with those who were trained in conventional learning theory.[34] In over 85 percent of the tests of significance, there was a tendency for student teachers trained in interaction analysis to be more accepting, less critical, and less directive than student teachers not trained in interaction analysis.

In addition, specific areas of the matrix differentiated student teachers who know interaction analysis from student teachers who did not know interaction analysis. These are the major findings:

1. Student teachers who know interaction analysis talked less in the classroom than those trained in conventional learning theory.
2. Student teachers who knew interaction analysis were more indirect in their use of motivating and controlling behaviors.
3. Student teachers who were taught interaction analysis were more indirect in their overall interaction patterns.
4. Student teachers who were taught interaction anslysis used more extended indirect influence.
5. Student teachers who were taught interaction analysis used less extended direct influence.
6. Student teachers who were taught interaction analysis used more extended acceptance of student ideas.

Yet another interesting finding came from the Amidon study. When the student teachers were compared on several variables, the student teaching groups in which both the student teachers and the supervising teachers were trained in interaction analysis had from seven to fifteen times greater variability than the groups of student teachers who were untrained and whose supervising teachers were untrained.

Soar continued to probe the effects of teacher behavior by again studying pupil growth in achievement and pupil attitudes toward the classroom.[35] By applying interaction analysis as a research tool and using Fowler's *Hostility Affection Schedule*, he was able to isolate for study several factors related to classroom climate.[36] In vocabulary study, indirect teacher control produced significantly more growth than direct teacher control, and low-hostile classrooms produced significantly more growth than high-hostile classrooms. The best combination of conditions produced approximately two and one-half more months of growth than did the poorest combination over a time span of seven months.

Summary

The research reported in this section dealt with attempts to assess the social-emotional climate in the classroom, with major attention given to teacher-pupil verbal interaction. Research findings have progressed from a polarization of teacher traits, dominative and integrative,

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[29]N. A. Flanders et al., Helping Teachers Change Their Behavior (Ann Arbor: University of Michigan, 1963, U. S. Office of Education Project Numbers 1721012 and 7-32-0560-171-0.)

[30]Jeffrey Kirk, *The Effects of Teaching the Minnesota System of Interaction Analysis on the Behavior of Student Teachers* (unpublished Ed. D. dissertation, Temple University, 1964), p. 153.

[31]Richard Zohn, *The Effect of Cooperating Teacher Attitudes on the Attitudes of Student Teachers* (unpublished paper, Glassboro State College, Glassboro, New Jersey, 1964), p. 31.

[32]Donald Medley and Harold Mitzel, *Measured Changes in Student Teaching*, eds. Herbert Schueler, Milton Gold, and Harold Mitzel (New York: Hunter College of the City University of New York, 1957), p. 202.

[33]Zohn, op. cit., p. 32.

[34]Edmund Amidon, *The Use of Interaction Analysis at Temple University*, The Study of Teaching, ed. Dean Corrigan (Washington, D. C.: The Association for Student Teaching, 1967), pp. 53-54.

[35]R. S. Soar, *An Integrative Approach to Classroom Learning* (Columbia: National Institute of Mental Health, University of South Carolina, 1966), p. 89.

[36]B. D. Fowler, *Relations of Teacher Personality Characteristics and Attitudes to Teacher-Pupil Rapport and Emotional Climate in the Elementary Classroom.* (Unpublished Doctoral dissertation, University of South Carolina, 1962), p. 169.

to classification systems for quantifying verbal behavior. These findings clearly establish a relationship between teacher behavior and student outcomes.

The research presented here indicated that student teachers trained in interaction analysis are different from those not so trained. Those student teachers trained in interaction analysis have patterns of verbal behavior like those teachers in the studies by Flanders, Zohn, Kirk and Amidon, whose pupils achieved more.

Perhaps the most exciting implication is that when student teachers and their supervising teachers know interaction analysis, the student teachers are more likely to have a maximum opportunity to develop a wider repertoire of teaching behaviors. Thus, interaction analysis appears to increase the possibilities for the selection of appropriate teaching behaviors in varying situations and may well increase individuality in styles of teacher behavior.

INTERACTION ANALYSIS AND SUPERVISION

Although learning theories are necessary to the understanding, prediction, and control of the learning process, they cannot suffice as a teacher considers his classroom performance. The goal of education—to engender learning in the most desirable and efficient ways possible—would seem to require an additional science and technology of teaching. To satisfy the practical demands of the classroom teacher, theories of learning must be examined so as to yield theories of teaching.[37]

The need for theories of teaching seems to have stemmed from the insufficiency in principle of theories of learning. Theories of learning deal with what the learner does. But changes in education must depend in a large part upon what the teacher does. Despite the years of research and the development of several sophisticated theories, the teacher's classroom activities have been relatively unaffected by what the learning theorist has to say.

Pearl, one of teacher education's chief critics, says that a teacher must become a manager and organizer of complex social organizations.[38] Everything that occurs in either preservice or inservice education of teachers must specifically bear upon acquiring these attributes. Unless the educational experience can demonstrate by logic and evidence that the material it offers increases the teacher's ability to negotiate social contracts; to sell, package, and deliver valuable information; to understand the problems of youth; and to organize staff and students in more effective social relationships, that program is superfluous.

Gage would place the behavior of teachers in the position of independent variables as a function of which the learning of pupils is to be explained.[39] Stated in another way, theories of teaching should be concerned with explaining, predicting, and controlling the ways in which teacher behavior affects the learning of pupils. Yet what we know about learning is inadequate to tell us what to do about teaching.

Performance as a teacher demands that the practitioner possess teaching skills, human interaction and behavior patterns in order to function efficiently in a variety of teaching learning situations. It is in this area that the greatest discrepancy usually occurs between the form in which the teacher receives the information and the form in which the teacher must actually use the information, i.e., through the development of patterns of classroom behavior. Shoplin reports that a basic assumption that must undergird inservice education programs is that teaching is behavior, and as behavior is subject to analysis, change and improvement.[40] The concept of improvement implies that there are controlling objectives in teaching, and that the teaching skills and behavior patterns can be organized to accomplish these objectives.

A technique suggested by Shoplin called for training in self-analysis as a primary objective in inservice education programs, for most teaching occurs in isolation from other critical adults.[41] Thus supervisory services are minimal. Unfortunately much of the inservice study undertaken by teachers has little specific application to the improvement of the instruction they offer. Until this situation is changed, major reliance is automatically placed upon the teacher to analyze and criticize his own works. Moreover, infrequent visits by supervisors, like that of the college supervisor reported earlier, present little possibility for improving teaching.

Present programs of teacher preparation emphasize conceptual information separate from its use and give little attention to training in the techniques and skills required in the teacher's works. Amidon and Flanders thus suggest that interaction analysis is a tool that can be of great use to an inservice teacher in improving that teacher's role as a guide in the learning processes of his pupils.[42] The system can give the teacher a way of gathering objective data about his own behavior without the aid of another person.

Amidon, Kies, and Palidi say that the secrecy that characterizes the principal-teacher or supervisor-teacher conference which follows classroom observation surrounds the process of supervision with a "negative halo" effect, in that such confidentiality is generally seen to imply criticism.[43] If supervision, defined as the improvement of instruction, can be carried out so that classroom

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[37]N. L. Gage, *Theories of Teaching,* Theories of Learning and Instruction (Chicago: University of Chicago Press. 1964), p. 269.

[38]Arthur Pearl, *On Teacher Education,* National Education Association Journal (Washington: National Education Association, May, 1968), p. 14.

[39]Gage, op. cit., p. 272.

[40]Judson Shoplin, *Practice in Teaching,s, Harvard Educational Review* (Cambridge: Harvard University, 1967), p. 24.

[41]Ibid., p. 26.

[42]Amidon and Flanders, op. cit., p. 63.

[43]Edmund Amidon et al., A Fresh Look at Supervision (Unpublished paper, Temple University), p. 1.

teachers can view it as challenge without threat, it may be appropriate to apply an approach that directs attention to the act of teaching, rather than to the teacher.

In directing supervisory attention to the act of teaching rather than the teacher, one can hypothesize that group supervision can become an effective procedure in breaking away from the secrecy of the supervisory conference. Amidon states that the dynamics of small groups enhance both the effect of the process and faculty inter-personal relationships in the dimensions of peers and so-called status personnel.[44] Communication is opened, cohesiveness is encouraged, group norms are clarified for general understanding, and group goals are clarified. In group supervision the problem must always concern the act of teaching.

Summary

The thesis of this section of the research is that some of the sources to which educators have traditionally turned for guidance and advice may not move the field of education as far forward as it was believed possible. In particular, it was stated that the understanding and tactics of the learning theorist are of less potential value to the practicing educator than is commonly assumed. The sole use of this perspective fails in significant ways to come to grips with the reality of classroom events. A new look at teaching seems to require us to move up close to the phenomena of the teacher's world. Combs and Snigg hold that the genius of good teaching lies in the ability to challenge students without threatening them, and that the distinction between challenge and threat lies "not in what the teacher thinks he is doing, but in what the students perceive him to be doing."[45] Thus the task of supervision is to observe this ability of teachers, as communicated to pupils. The social-emotional climate of the classroom is largely influenced by the many-faceted dialogue between the teacher and the pupils. By directly observing this dialogue, one can scrutinize the ability to challenge without threat.

The research involving interaction analysis seemed to indicate that the technique does increase a teacher's sensitivity to his own verbal behavior and his understanding of how this behavior affects classroom climate and individual pupils. The Flanders System of Interaction Analysis provides the teacher with a relatively simple technique through which he can compare his own performance with his intentions, through which teacher-pupil dialogue can be studied.

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[44]Ibid., p. 2.

[45]A. Combs and D. Snigg, Individual Behavior (Evanston: Harper and Row, 1961), pp. 289-290.

CHAPTER III
METHODS AND PROCEDURES

In Chapter I, the general objective of this research was stated as an attempt to develop a self-instructional program to teach the Flanders System of Interaction Analysis to inservice teachers so that they might examine their own classroom performance through the use of a direct observation technique. This self-instructional program was to consist of a series of instructional modules and tape recorded classroom sessions designed to facilitate the learning of the interaction analysis technique.

This chapter is an overview of the procedures employed in developing the self-instructional program procedures were a particular concern since they represented the application of an analysis of behavior to the practical problems of classroom teaching. Thus the self-instructional modules were a product of this application.

The idea for the development of a self-instructional program for teaching interaction analysis to inservice teachers originated with the Research staff of the Appalachia Educational Laboratory in Charleston, West Virginia.

Developmental Stage

Dr. John Hough of Syracuse University, Dr. N. A. Flanders of the University of Michigan, and Dr. James Ranson of the Appalachia Educational Laboratory served as a panel to help decide on a basic design for the self-instructional program. Critical initial decisions made with the advice of the panel included the identification of the salient features of the Flanders System of Interaction Analysis that should be treated in any self-instructional program. The salient features were arranged in a sequential order, with each becoming a theme for each unit or division of the self-instructional program. The decision was made to call each unit or major theme an instructional module or instructional session. Each module was to consist of stated objectives, an explanation of the theme for the module or the practice session, and feedback for the student.

In addition, the following decisions were made after consultation with the panel:

1. The materials were to be designed to require no more than ten hours of study time for the classroom teacher.

2. The modules were to include tapes of live classroom situations to be used by classroom teachers in perfecting the skills of interaction analysis.

3. All modules were to be self-instructional, built around specific behavioral objectives, and were to contain feedback data for the benefit of the teacher.

Nine instructional modules were ultimately developed to form a complete program. When the modules were completed they were sampled to members of the target population, inservice teachers, for a response. These teachers actually served as editors, pointing out ambiguities which called for resolution, indicating difficult points that demanded clarification, and indicating where the program was trivial and uninteresting. This process of testing and revision was pursued until the point had been reached where additional editing did not appreciably alter the form of the modules.

In addition to the responses of members of the target population, the panel was again asked to assess the quality of the taped classroom situations and the techniques employed to provide feedback data to the inservice teacher.

The feedback at this stage consisted of interpretations of observations as the modules were reviewed by the classroom teachers and the panel. This activity called for a keen sensitivity to subtle indications of problems. Gaps in the presentation, unpredicted confusions, overgeneralizations, or even the failure to generalize also were noted.

VALIDATION TESTING STAGE

First Field Test Group

The first field test group was composed of six members of the teaching staff at Kellogg Elementary School in Wayne County, West Virginia. With this group there was no attempt made to randomly sample the staff, since all served on a volunteer basis. Five female teachers and the male principal volunteered.

The format of this trial consisted of ten one-hour sessions with the author of the materials being present for each session. The participants studied one module per week and were not permitted to see the modules in advance of the study session. The author did not comment on the content of the module until each participant had studied for the suggested length of time. After the study period, the test group was administered a short objective examination based on the content of the module. Only then were teachers permitted to openly discuss the modules.

The discussion which followed the study and testing period was taped to be analyzed later. Questions raised by the participants were assumed to indicate areas of weakness in the materials. Items missed on the content examinations were considered in the same light. Teachers' questions were freely discussed with the participants at this point in the session so that the participants would be prepared for the subsequent session. This process overcame weaknesses in the instructional modules.

The major objectives of the first field test were threefold:

1. To gain immediate feedback from a test group representative of the target population for whom the program was designed concerning reading level,

use of technical terms, the quality of the writing, sequence, size of modules, and the practice time required for learning.

2. To gain immediate feedback concerning the achievement of the test group relative to the objectives for each session.

3. To gain suggestions from the test group relative to the improvement of the techniques employed.

Second Field Test Group

The second field test group was composed of thirteen teachers, one counselor, and one principal on the summer school staff of the Chesapeake, Ohio School System. Four of the teachers taught at the elementary school level and nine taught at the secondary school level. Every teacher on the summer school staff participated in the field test. Each of the teachers expressed a willingness to become a part of a group of three or four to study the materials and to aid each other in making tape evaluations based on interaction analysis.

The nine instructional modules which had been revised from the first field test were presented to the participants as a complete packet of materials. Group leaders accepted the responsibility for arranging a schedule so that members of each group could study together. The author did not at any time meet with any group for the purpose of explaining any aspect of the modules being studied. However, the groups were asked to keep notes on progress of the study sessions and points of disagreement caused by ambiguities still remaining in the materials. Three times during the field test the author did meet with the total group for the purpose of taping expressed feelings about the success of the instructional modules. Again, the author did not supplement the instructional modules in any way. These tapes were later analyzed to gain further insight into the adequacy of the modules. The group was also encouraged to make judgments of achievement in terms of the behavioral objectives for each module.

After completion of the nine-hour study period, a context examination was administered to the total group of participants and evaluated in terms of the instructional objectives. The test was designed to appraise the level of content knowledge attained by the group, skill in categorizing verbal behavior, skill in plotting the matrix, and the ability to interpret the matrix. The test was scored on a percentage basis relative to the behavioral objectives previously established.

Following the testing period, participants were given another opportunity to critically analyze the modules.

The specific objectives for the second field test were:

1. To determine if the materials as developed would teach a cognitive knowledge of the Flanders System of Interaction Analysis.

2. To determine if the training tapes as developed would serve as tools to enable classroom teachers to develop an acceptable level of skill in taking interaction analysis.

3. To gain additional feedback on reading level, use of technical terms, quality of the writing, sequence, size of modules, and practice time.

4 To gain additional feedback for improving the techniques employed in the entire self-instructional package.

Changes During The Testing Stages

Changes During the Developmental Stage

The panel offered two major suggestions improving the modules during the developmental stage. The first suggestion was that objectives for each of the instructional modules should be behaviorally stated so that the classroom teacher could have a clear basis for judging performance. Objectives were written to meet the criteria of extent and performance for each module.

The second major suggestion of the panel involved the feedback given to the teacher. Feedback information was provided at the end of each module so that the teacher might further appraise his performance. This was especially true for the taped training situations. As a classroom teacher practiced the categorization process, he was given feedback information by which he could appraise his performance.

Classroom teachers who responded to the "rough drafts" of the instructional modules limited their responses largely to their perceptions regarding the interest of the content; the personal appeal built into the writing; the clarity with which concepts were explained; and the quality of the exercises designed for classroom teachers to use in learning interaction analysis. Critical comments that were typical of this phase of the study included: "material needs to be more coherent;" "booklets need to be less personal;" "the material is too difficult to learn by self-instruction;" "some of the ideas are not practical;" and "teachers are too involved in other concerns."

On the other hand, most teachers were acceptive of the instructional modules. Typical comments included "the personal appeal to the reader draws one to the materials" and "the content brings about an awareness of one's verbal behavior that few people naturally possess."

There were many suggestions offered relative to the use of technical terms and poor grammatical expressions.

Changes During the Validation Testing Stage

The feedback data obtained during the validation testing stage proved to be most helpful in later revisions of the modules. The first field test group made numerous

suggestions for the elimination of such terms as "expertise" and "modular." Numerous suggestions dealt with the mechanics of acceptable grammar. Perhaps the most ingenious suggestion involved the use of a metronome for the taped classroom situations that are used in building the skill involved in categorizing verbal behavior. Because of this suggestion, the early training tapes have the click of a metronome every three seconds to help the inservice teacher record the verbal behavior at three-second intervals.

In addition to these suggestions, the first field test group aided in selecting taped classroom situations that were suitable for the training tapes. Some original tapes had so much extraneous noise that they proved to be of no value as training tapes.

The original design of the self-instructional program called for three training tapes to be included in the program. At the suggestion of the first field test group, another training tape was included to provide a greater variety of classroom situations for analysis.

Because the author freely discussed the module being studied with the first field test group at the close of each study session, the test data were not relied upon as an indication of areas of strength or weakness. However, this was not true for the second field test group. Since the author did not discuss the modules in any way, test data were assumed to be indications of areas of strength and weakness. These points needed further attention by the author:

1. The importance of identifying situational variables in the classroom being taped to aid in interpreting the data.

2. The further definition of the word "criticism" used in describing Category 7.

3. The further definition of I.D. Ratio and Revised I.D. Ratio.

4. The need for additional attention to the general areas of the matrix.

5. The need for further identifying the types of classroom activities that can be recorded and plotted on a matrix.

6. The need to categorize verbal interaction in terms of the affect of the interaction on the student.

In addition to these content suggestions, the second field test group suggested a complete reworking of the introductory section of the self-instructional program, indicating that an unfavorable impression is gained from the choice of words used. Specifically, the test group reacted negatively to the use of the term "theory of instruction." This suggestion was heeded and the introduction was rewritten.

The second field test group also suggested that the taped training sessions should be selected to illustrate specific types of verbal behavior as defined by the categories of interaction analysis. This suggestion was also heeded and resulted in major changes to some of the training tapes. Training tape #2 was divided into one and two-minute segments, each of which illustrates specific behaviors. The narrator suggests to the inservice teacher the types of verbal behavior to be expected. The actual situation is then played back and the narrator reviews it and suggests the categories that should have been recorded. This technique, along with the metronome, permitted the inservice teacher to perfect both the timing and accuracy of the recording process.

Summary

Chapter III has reviewed the methods and procedures involved in the development of the self-instructional modules for teaching inservice teachers the Flanders System of Interaction Analysis. The process was first carried through a development stage with a panel acting as consultants. Members of the target population served as editors for the rough draft of the written materials and the training tapes.

The second phase of the development of the materials was the validation testing stage. The first field test group consisted of six teachers from Kellogg Elementary School in Wayne County, West Virginia. The second field test group consisted of fifteen teachers from the public school system of Chesapeake, Ohio. Each of the field test groups studied the materials according to the preestablished standards and provided feedback data to be used by the authors in a revision process applied to the modules being developed.

CHAPTER IV

PRESENTATION OF THE DATA

The development of a series of self-instructional modules to teach the Flanders System of Interaction Analysis required the participation of members of the target population in both the developmental and validation phases. A member of the staff at Marshall University, Dr. Bernard Queen, who had served as an administrator in Wayne County, West Virginia, made the initial contacts with West Virginia teachers who might have been interested in the research project. An overview of the project's objectives and strategies was presented to these prospective participants. A sufficient number of teachers readily agreed to work with the researcher in the development of the self-instructional modules.

Since it was realized that the success or failure of the proposed project rested heavily upon the cooperation of a local school building staff, Dr. Queen was asked to contact some local administrators who might be interested in the project. Arrangements were made for him to meet with the staff of Kellogg Elementary School in Wayne County, West Virginia. This orientation session was designed to accomplish the following: (1) to provide a rationale for the conduct of the research (2) to provide a rationale for teacher participation in the developmental and validation phases (3) to provide a step-by-step overview of the responsibilities of participating teachers (4) to identify teachers who would be willing to participate on a voluntary basis.

At the close of the session, six teachers volunteered to become a part of the first field test group. The researcher decided that this was a sufficient number for the first field test.

A similar procedure was followed in selecting the second field test group. The researcher met with the superintendent of the Chesapeake School District at Chesapeake, Ohio and explained the project and the rationale for the development of the self-instructional modules. At a subsequent orientation meeting with the summer school staff, fifteen teachers volunteered to become members of the second field test group.

The procedures employed with each of the developmental and validation test groups were discussed in Chapter III.

Purpose and Organization of Chapter IV

The purpose of this chapter is to present the data that were collected from the teachers who agreed to participate in the development and validation phases of the project. The data were presented and analyzed by two project stages, the developmental stage and the validation testing phase. For each stage and each field test group, the data were grouped by responses to each of the self-instructional modules.

Treatment of the Data

The data for the development stage of this study were considered to be very subjective. The demands of the process of development as described in Chapter III required a trial and error basis instead of controlled conditions required by experimentations in the classical sense. Feedback from members of the target population who helped in the development stage was classified, grouped, and is reported in this chapter.

Data for the validation testing stage which involved two field tests groups were more objective since terminal behaviors specified the criterion of effectiveness for the instructional process to be achieved with the self-instructional materials. These terminal behaviors, which were sharpened and stated in objective terms, led to the development of a criterion test for evaluating the efficacy of the instructional process. Judgments regarding instructional efficacy were made on the basis of performances of field test groups participating in the criterion test.

ANALYSIS OF THE DATA

Developmental Stage

The role played by the panel of experts proved to be critical, especially in the beginning stages of the study. Dr. N. A. Flanders, who developed the Flanders System of Interaction Analysis, was contacted by mail to advise on the structure of the instructional modules. Dr. John Hough of the staff of Syracuse University and a student of Dr. Ted Amidon, who worked jointly with Dr. Flanders in some of the early research with interaction analysis, made three trips to Charleston, West Virginia, to advise on the design and structure of the instructional modules. Dr. James Ranson, a former student of Dr. Hough, worked daily with the project in the early developmental stages.

The following guiding principles were agreed upon by the panel prior to the development of any of the materials:

1. The materials were to be designed to require no more than ten hours of study time for the classroom teacher.

2. The instructional sessions or modules were to include audio tapes of live classroom situations to be used by inservice teachers in perfecting the skills of interaction analysis.

3. All instructional modules were to be self instructional, built around specific behavioral objectives, and were to contain feedback data for the benefit of the inservice teacher.

One of the resulting major decisions made in consultation with the panel of experts concerned the scope and sequence of the self-instructional modules. This consulta-

tion resulted in the following sequence being established for the instructional modules which are called "sessions" in the programmed booklet:

Session I	An Introduction and General Description of Interaction Analysis
Session II	Techniques and Ground Rules for Categorizing Verbal Behavior and Hints for Discriminating Among the Categories
Session III	Situation I of the Training Tapes
Session IV	Situation II of the Training Tapes
Session V	Situation III of the Training Tapes
Session VI	Situation IV of the Training Tapes
Session VII	Techniques for Plotting and Building the Matrix
Session VIII	Interpretation of the Matrix
Session IX	Interpretation of the Matrix by Using Model of Verbal Behavior

The panel, each of whom had had extensive teaching experience with interaction analysis, agreed that this represented a logical and suitable developmental sequence. In addition to the determination of the sequence for the instructional sessions or modules, the experts helped to design a sequence for the training tapes used for sessions three through six. First it was decided that audio taped of live classroom sessions should be used. Second, certain terminal behaviors were established to guide in the development of the taped training situations.

As a result of working with the training tapes, the teacher should:

1. Be able to apply the ground rules for categorizing verbal behavior.

2. Be able to classify verbal behavior at three-second intervals or at a rate of between 17 and 22 categorizations per minute.

3. Be able to classify verbal behavior for 10 to 15 minutes at improving levels of accuracy for the total categorization period. For the beginner an error range of plus or minus 20 percent was deemed satisfactory for the first practice sessions. This range should improve to plus or minus 10 percent with four hours of practice.

Last, the panel of experts determined that the first taped classroom situation should be general, possessing many categories of verbal behavior, and should contain narration to help the inservice teacher discriminate in classifying the verbal behavior employed. The second taped classroom situation should contain short segments of classroom behavior with narration to alert the inservice teacher to the type of verbal behavior to follow and feed back information by which the inservice teacher could judge the accuracy of the categories recorded and the accuracy of recording at three-second intervals. Situation III of the training tapes was to be designed to further improve the accuracy and timing of the categorizing process and to reinforce the first two sessions of the self-instructional booklet by reviewing the content of those sessions. Situation IV of the training tapes was to be an extended classroom session to permit the classroom teacher to test his ability to record accurately for a sustained period of time.

Feedback was to be provided for each training session so that the inservice teacher could assess performance.

As the sessions or instructional modules were developed, they were reviewed by the panel.

The following list of suggestions was representative of the criticism offered by the panel:

Some terminology may be foreign to inservice teachers.

The general tone of the writing needs to be more personal.

The feedback data for the inservice teacher needs to become more specific or direct in the later sessions or modules.

The quantity of material presented in each of the sessions or modules seems to be about right to require one hour of study time.

The materials seemed not to develop an adequate definition of interaction analysis until the seventh session or instructional module.

The sessions or instructional modules were also sampled to classroom teachers who were representative of the target population. This amounted to a process of testing and revision though no objective data were collected. These teachers actually served as editors, pointing out ambiguities which called for resolution, indicating difficult points that called for clarification, and indicating those materials that were trivial and uninteresting. This process was pursued until the point had been reached that additional editing did not appreciably alter the form of the modules.

The criticism received from members of the target population to whom the instructional modules were sampled during the developmental stage was somewhat different from that received from the panel. The panel commented more on the cognitive aspects of interaction analysis as a way of quantifying verbal behavior. The members of the target population spoke more to the utilization of the

materials by a classroom teacher. The following list was considered to be representative of the criticism of classroom teachers.

> The reading level seemed to be suitable.
>
> A teacher should not have to devote more than one hour per week to the materials.
>
> The suggested study time might be broken down into three twenty- minute periods for a particular module.
>
> The writing seemed to have a personal appeal.
>
> The study time suggested for the instructional modules seemed to be appropriate.

The criticism received from the panel and classroom teachers was considered and was reflected in the revisions of the instructional modules prior to the first field test of the materials.

Validation Testing State

First Field Test Group. The first field test group served to bridge the gap between the developmental and validation stages of the project. The group was composed of six members of the teaching staff at Kellogg Elementary School in Wayne County, West Virginia. Five female teachers and the male principal all served on a voluntary basis.

The major objectives of the first field trial were threefold:

1. To gain immediate feedback from a test group representative of the target population for whom the self-instructional program was designed concerning reading level, use of technical terms, the quality of the writing, sequence, size of modules, and the practice time required for learning.

2. To gain immediate feedback concerning the cognitive achievement of the test group relative to the objectives for each session and each instructional module.

3. To gain additional suggestions from the test group relative to the improvement of the techniques employed.

The first field test group was involved one hour per week for a period of ten weeks. During each of these sessions, one instructional module of materials was given to the teachers who were asked to study the materials for one hour. Test group participants were not permitted to see the module of materials previous to the study session and no comments were made about the materials until the study session was completed. Following the study session, each test group participant was administered a criterion test based on the cognitive content of the instructional module. Only then was discussion of the module permitted. For this test group the author engaged in active discussion of the module including the cognitive content and the instructional techniques employed. This discussion was audio taped and later studied for possible revision of the instructional module. The data gathered from the administration of the criterion test were also studied and were used to guide a further revision of some of the instructional modules.

Session One of the self-instructional materials dealt with the introduction and general description of interaction analysis. The analysis of the audio tape of the discussion that followed the study period indicated that the first field test group still had serious questions about the major purposes of interaction analysis. The use of the term "theory of instruction" was questioned because of its vagueness as used in the context of the materials. The meaning which the field test group obtained from the term was not desirable and lacked the precision normally associated with a system for quantifying verbal behavior.

The short criterion test that was administered supported the findings of the audio tape analysis. The field test group had difficulty recognizing the purpose and utility of interaction analysis.

Session II. Session Two of the self-instructional materials dealt with the techniques and ground rules for categorizing verbal behavior and hints for discriminating among the categories. The field test group again indicated a lack of facility in using some of the terms employed by Flanders in his Interaction Analysis system. The term "criticism" was used by Flanders to describe verbal statements by the teacher which restricted student freedom. The test group associated this term with "badness."

In addition, the tape analysis revealed that the ground rule suggesting that the recorder categorize verbal statements in terms of the affect of the talk upon students was the basis for several questions and comments during the discussion.

The test data for Session II revealed that the field test group experienced some difficulty in identifying situational variables present in a classroom that should be noted prior to taking interaction analysis and experienced some difficulty in recognizing classroom activities that can be appropriately categorized. The group also indicated that a strong feature of Session II was the hints given for discriminating among the verbal categories.

Sessions III, IV, V, VI Sessions Three, Four, Five, and Six consisted of audio tapes of live classroom situations selected and designed to train inservice teachers in the mechanical skills of taking interaction analysis. Because of early difficulties in recording at three-second intervals, one of the first field test groups suggested putting the "click" of a metronome on the early training tapes to help the teachers perfect the timing of the recording process. This suggestion was heeded and the metronome "click" has been included on training tapes two and three.

The major contribution of the first training tape as viewed by the field test group was to aid in differentiating among the categories of verbal behavior as defined by the Flanders System. This was in line with the objectives of the authors. The practice segments were varied in length and included much narration to explain the use of selected categories.

The technique of the second training tape was similar to that of the first training tape. The subsequent revisions of the technique, based on suggestions of the panel and the first field test group, resulted in the training tape consisting of several one and two-minute segments of classroom interaction. The narrator alerts the trainee to the categories that are to be used by the teacher and students in each of the segments. At the conclusion of each segment, feedback is given so that the trainee can judge his performance. The consensus of the first field test group was that this tape proved to be the most useful in mastering the skill of categorizing.

Training tape three was revised to include the "click" of the metronome. This tape was created from a prepared script which involved a discussion of interaction analysis. The discussion reinforced the cognitive aspects of interaction analysis that were treated in the first two sessions or self-instructional modules of the booklet.

The first field test group expressed some concern at this point over the lack of perfect agreement in the categorizing of the verbal behavior on the tapes. The content of training tape three includes this point and fears caused by this lack of agreement were thus allayed.

Training tape four contained fifteen minutes of uninterrupted classroom verbal interaction. This tape was included to meet the criterion terminal behavior of taking interaction analysis for an extended period of time with the total number of categorizations recorded. The total number of categorizations for each of the ten categories of verbal behavior fell within the plus or minus ten percent error range. The consensus of the first field test group was that this standard was difficult with four hours of practice, but was achievable.

At the close of the four hours which were devoted to practicing categorizing skill at three-second intervals, the first field test group was asked to categorize a ten- minute segment of classroom verbal interaction with which they had had no prior contact. An evaluation of inter-rater reliability was made by computing Scott's pi coefficients between all combinations of raters and a categorization of the tape made by the authors.[1] The complete matrix of pi coefficients is presented below.

The resulting average pi coefficient for all of the possible combinations of raters was .68. An average coefficient of .60 is considered useful to study one's own behavior.

The categorization sheets of the first field test group for the ten-minute tape of classroom interaction were also examined for accuracy of recording at three-second intervals and the accuracy of selecting the appropriate category. The ten-minute segment of classroom interaction was first rated by three persons skilled at taking interaction analysis. This rating served as the standard for judging the performance of the first field test group and is shown on the first row of Table 1, page 76.

Only one of the six members of the first field test group failed to score within the plus or minus 10 percent error limits for the total categorizations recorded for test tape of ten minutes duration. There was more variation when the number of categorizations made for each category was compared. This variation in categorizations for each category accounts for the average scott's pi coefficient of .68 as shown on Figure 1. The panel of experts, speaking from the experience of teaching and using interaction analysis, suggested that these figurees fall well within the limits of usability for a classroom teacher to study is own classroom verbal behavior.

Session VII. Session Seven dealt with the mechanics of transferring the original categorizations to the matrix for further study and analysis. An analysis of the audiotaped discussion with the first field test group following the study period indicated that the teachers still had some concern about the necessity of maintaining the sequence of the data as originally recorded. The plotting procedure, as explained in the self-instructional module, was then reviewed and revised to improve clarity.

The authors noted that the teachers were not discussing the matrix in terms of specific cells. On the basis of teaching experience, this aspect seemed to be essential to any interpretation of the matrix. This resulted in another revision of this self-instructional module.

The simple mathematical calculations explained in Session Seven seemed to present no difficulties for the test group.

An analysis of the criterion test for this self-instructional module confirmed the need to reexamine the section dealing with single-cell identification and meeting.

Session VIII. Session Eight dealt with the interpretation of the matrix after all the math calculations were completed. The field test group felt that the strongest aspect of this self-instructional module was the quality of the feedback in the exercise at the end of the self-instructional module. The group recognized that one cell, considered alone, is not particularly useful in interpreting the matrix, but must be considered in relation to the presence or absence of tallies in other cells.

An analysis of the test data revealed that the test group experienced some difficulty recognizing the meanings of these general areas of the matrix: extended direct influence area, transitional cells, teacher response to student talk area, and the student talk following teacher talk area. An attempt was made to strengthen these aspects of this self-instructional module.

Session IX. Session Nine of the self-instructional modules dealt with matrix interpretation by studying patterns or models of verbal behavior that can be seen on any

[1] W. A. Scott, *Reliability of Content Analysis: The Case of Nominal Scale Coding*, Public Opinion Quarterly, XIX (1955), 321-325.

Figure 1

Matrix of Scott's Pi Coefficients of Inter-Observer Agreement in Categorizing Test Tape

First Field Test Group

	1	2	3	4	5	6	E[a]
1	–	.67	.64	.73	.65	.71	.61
2		–	.68	.72	.70	.68	.65
3			–	.64	.59	.61	.63
4				–	.68	.68	.74
5					–	.71	.69
6						–	.78
E							–

[a]This column shows the pi coefficient between the author's rating of the tape and each of the six members of the first field test group.

Table 1

Number of Responses to Test Tape
by Category Number

First Field Test Group

Rater Number	Number of Categorizations by Category Number										Total Categorizations
	1	2	3	4	5	6	7	8	9	10	
	Standard										
	4	11	33	41	63	19	9	21	10	4	215
1	1	8	30	48	71	15	10	24	12	2	221
2	0	5	25	44	77	25	4	30	8	7	225
3	2	8	30	39	55	12	7	15	7	3	178[a]
4	0	13	28	41	65	15	12	15	18	10	217
5	1	10	45	35	58	15	21	28	8	12	231
6	3	7	22	47	57	16	11	14	6	5	198

[a]This is the only rater who failed to fall within the terminal behavior limits of plus or minus 10 per cent for the total number of categorizations recorded.

matrix of classroom verbal interaction. In the discussion following the study session, the test group showed considerable facility in recognizing patterns of verbal behavior and in making hypotheses based on these patterns of verbal behavior. Again the strength of Session Nine seemed to be in the feedback offered the test group as various matrices were studied and in the questions that were raised regarding patterns of verbal behavior.

As a part of the criterion test for this self-instructional module, members of the test group were given a completed matrix and were asked to identify a pattern of verbal interaction and to make at least five hypotheses based on that pattern of verbal behavior. The authors concluded that each member of the group was reasonably successful in making this analysis.

Summary.

The first field test group served to bridge the gap between the developmental stage and the valadation testing stage. The group studied the self-instructional modules over a ten-week period. Data were collected by means of open discussions of the materials following the study sessions and by means of criterion tests and terminal behaviors for each of the self-instructional modules.

Test data were not reported because discussions took place freely for each module with the field test group following the prescribed study session. However, they were considered in judging areas of strength and weakness in the materials.

Second Field Test Group. Basic data collected from the first field test group resulted from the close observation of, and interaction with, individual members of the test group. Data collected from the second field test group were more descriptive of the performance characteristics of the self-instructional modules that were developed.

The specific objectives of the work with the second field test group were:

1. To determine whether the program as developed will teach a cognitive knowledge of the Flanders System of Interaction Analysis.

2. To determine whether the training tapes will serve as tools to enable classroom teachers to develop an acceptable level of skill in taking interaction analysis.

3. To gain additional feedback on reading level, use of technical terms, quality of the writing, sequence, size of segments, and the amount of practice.

4. To gain additional feedback for improving the techniques in the self-instructional program.

The second field test group was composed of thirteen teachers, one counselor, and one principal on the summer school staff of the Chesapeake, Ohio School System. Four of the teachers taught at the elementary school level and nine taught at the secondary school level. Every teacher on the summer school staff participated in the field test. Each of the teachers expressed a willingness to become a part of a group of three or four to study the self-instructional modules and to aid each other in making audio tape evaluations using the interaction analysis technique. Each of the groups selected a leader who was responsible for arranging a schedule for the study and tape analysis sessions.

The author did not at any time meet with any group for the purpose of explaining any aspects of the modules being studied. However, the groups were asked to keep notes on progress during the study sessions and points of disagreement caused by ambiguities still remaining in the materials. Groups made tapes of their discussions that were later analyzed by the authors.

At the close of a nine-week study period, the author administered a content examination to the total field test group.

Analysis of Taped Discussions and Written Comments

The consensus of the second field test group regarding all the self-instructional modules was more positive than negative. The major strengths of the modules as seen by the second field test group were:

1. The personal appeal of the writing.

2. The feedback that enabled the trainee to judge progress and performance.

3. The use of the metronome on the training tapes.

4. The feedback that was included on Training Tape Number Two.

5. The specific aids included to help differentiate in the categorization process, including the narration on Training Tape Number One.

6. The interpretation aids included as parts of Sessions Eight and Nine.

The analysis of the taped discussions and the written comments, plus a study of the test items missed, pointed to these areas of weakness that may call for resolution before a further use of the self-instructional modules:

1. The importance of identifying situational variables in the classroom being taped to aid in interpreting the data. The term "situational variables" perhaps should be discarded and another chosen.

2. The further definition of the particular use of the work "criticism" in describing Category Seven.

3. The further definition of the interpretation to be gained from the revised i/d ratio.

4. The further identification of the types of classroom activities that can be recorded and plotted on a matrix.

5. The need to categorize verbal interaction in terms of the affect of the interaction on the student.

Analysis of Test Data

As proposed in Chapter I, the purpose of this research was to develop a series of self-instructional modules to teach the Flanders System of Interaction Analysis to in-service teachers. The success of this endeavor was to be determined largely by successful achievement of the second field test group relative to previously established performance criteria. The test and performance data collected from the second field test group were considered to be descriptions of the performance characteristics of the materials that have been developed.

The content examination was administered during the tenth week of the second field trial by the author. The results of the test are shown on Tables 2 through 5.

With a possible score of 60, the raw scores ranged from 47 to 59. All 15 members of the second field test group took the examination. The range located all scores at the 75 percent level or better. To view a copy of the examination, the reader should refer to Appendix A, page 109.

Data presented in Table 3 provided an analysis of the content examination by grouping the items by application to the instructional modules. All participants in the second field test group responded to each of the examination items. Out of a total of 720 possible, the second field test group responded correctly to 608, scoring at an average of 84.4 percent on the content examination.

The first session of the instructional modules dealt with the general aspects of interaction analysis. Six items on the examination (Items 1, 2, 3, 4, 14, 15) tested the participant's knowledge of those aspects. The second field test group responded correctly to 87 of a possible of 90 items for an average of 96.6 per cent. Three of the participants failed to recognize that interaction analysis may be used in an inservice education program, yet did recognize it as an aid to the classroom teacher in studying his own verbal behavior.

All of the participants identified the major divisions of teacher-talk and student-talk as defined by the Flanders System. Each saw some utility to the system in studying classroom behavior.

Five items on the examination (Items 5-9) dealt with procedures for classifying the verbal interaction of the classroom. The participants responded correctly to 61 of a possible total of 75 items which dealt with recording procedures for a percentage score of 81.3 for that part of the test.

The second field test group recognized the types of classroom activities that can be analyzed, using interaction analysis, and recognized the major ground rules for classifying verbal behavior. Seven of the fifteen respondents did not recognize that classification of a verbal statement should be done in terms of the possible effect of that statement on the students. Four of the fifteen respondents failed to identify situational variables such as subject area, grade level, and achievement level that might be helpful in interpreting the data ultimately collected.

Those items (Items 10-13) that dealt with the rules for plotting a matrix proved to be the most difficult for the second field test group since the percentage score was 75. The ground rules for plotting the matrix proved to be no problem for the participants, but nine of the fifteen respondents failed to distinguish between the Revised Indirect/Direct Ratio and Indirect/Direct Ratio. (The former indicates the methods of motivation and control employed by the teacher; the latter expresses the ratio of indirect and direct teacher talk.)

Eight items (Items 36-43) dealt with the interpretation of the plotted matrix. The analysis of the responses indicated that respondents possessed a knowledge to adequately make single-cell interpretations, but had more difficulty recognizing what might be revealed by larger areas of the matrix. More specifically, nine of the fifteen respondents failed to recognize the general area of the matrix that indicates how a teacher typically responds to student talk. Areas of the matrix that the respondents recognized at a higher level of accuracy included the steady state and transitional cells, areas indicating silence, direct and indirect influence areas, and student talk areas. The group scored at a percentage level of 75.8 for the eight items that dealt with matrix interpretation.

Twenty items (Items 16-35) dealt with the classification of verbal behavior. The second field test group responded correctly to 264 of a possible 300 items for a percentage score of 88. Items 16-25 consisted of statements to classify. The group scored at a percentage level of 92.7 for these items. Items 26-35 consisted of statements dealing with the ground rules for classifying verbal behavior. The group scored at a percentage level of 83.3 for these items. Eight of the fifteen respondents failed to understand that the data recorded on any one matrix should represent only one type of classroom activity.

The last major section of the examination (five items 44-48) requested the respondents to make five hypotheses about the verbal behavior represented by a model that was "lifted" from a completed matrix. Sixty of a possible 75 hypotheses were judged to be logically derived from the model of verbal behavior that was given, meaning that the second field test group scored at a percentage level of 80.

The respondents in the second field test group recognized a basic discussion pattern represented by the matrix. Students felt free to discuss the content of the lessons; the

Table 2

Raw Scores on Criterion Test by Quartiles[a]

Second Field Test Group[b]

Quartile	Raw Score Range	Number of Examinees
4thq	46 - 60	15
3rd	31 - 45	0
2nd	16 - 30	0
1st	1 - 15	0

53.4 mean score

[a]The total possible score was 60.

[b]Fifteen participants composed the second test group.

Table 3

Analysis of Criterion Test Results
by Classification of Items

Second Field Test Group

Groups of Test Items	No. of Items	Possible Correct Responses	Corrrect Responses	Per Cent of Responses Correct
General Aspects of I. A.	60	90	87	96.6
Recording Procedures	5	75	61	81.3
Matrix Plotting	4	60	45	75.0
Interpreting the Matrix	8	120	91	75.8
Classification of Verbal Behavior	20	300	264	88.0
Interpretation by Use of Models	5	75	60	80.0
Totals	48	720	608	84.4

student discussion was generally accepted or praised by the teacher. This acceptance and praise generated further student discussion.

Moreover, the respondents recognized the basic circularity to model of verbal behavior .

The content examination also asked the examinee to transfer raw data to a blank matrix and to make the mathematical calculations that were called for, preliminary to making an interpretation of the verbal behavior pictured on the matrix. Table 3 showed the number of the second field test group who successfully performed to the standard of the terminal behaviors.

As indicated by Table 4, all examinees were able to transfer the raw data to the blank matrix with no more than 5 percent error. In addition, all examinees were able to accurately determine the number of tallies per column on the matrix.

Most of the errors that caused the lower percentage scores on Table 4 were simple miscalculations rather than errors in procedure. Ninety-three percent of the second field test group could accurately figure column percentages for the matrix, calculate the percent of teacher talk that was direct and indirect, and calculate the ration of indirect teacher talk to direct teacher talk as classified by the Flanders System of Interaction Analysis.

Eighty-seven percent of the field test group accurately calculated the percent of all talk attributed to the teacher, the percent of talk attributed to the students, and the revised indirect/direct ratio.

For the terminal behaviors listed as a part of Table 4, no group response was below the 87 percent level.

The content examination also asked the second field test group to categorize an audio tape of a live classroom situation. The tape was allowed to play for just slightly more than five minutes. These raw data were analyzed and reported on Table 5.

Row one of Table 5 showed the average combined ratings of three persons skilled in taking interaction analysis. The minimum and maximum limits (plus or minus 10 percent) established in the objectives and terminal behaviors were based on the 115 total recordings for the panel, as shown in row one. This meant that a total number of recordings falling within the range of 103 to 127 met the performance criterion. Two of the fifteen examinees, #4 and #9, failed to meet the criterion, both falling slightly above the maximum limitation.

A further study of Table 5 revealed the variation in the total number of recordings per category. In some cases this variation seemed to be extreme. However, Figure 2 presented the Scott's pi coefficients for all combinations of the second field test group, including the rating made by the experts. All coefficients reported fall within an acceptable performance area.

The column labeled "E" on Figure 2 showed the pi coefficient between the rating by the experts and each of the fifteen members of the field test group. Again the panel suggested that a pi coefficient of .60 or better was an indication of skill level suitable for studying classroom verbal behavior. The pi coefficients for Column E ranged from .65 to .78, all well above the minimum limitation.

The coefficient of observer agreement controls the chance factor which may be operating in any comparison of the categorized data that may be collected by one or more direct observers. For research purposes, observers have been sufficiently trained so that the coefficients have consistently reached the .85 level over extended periods of time. A lower level of consistency has been found sufficient for purposes of self- analysis of behavior.

Pi coefficients between members of the second field test group ranged from .63 to .81, all above the minimum limitation. The average pi coefficient for all combinations of raters was .72. Thus, though there is variation in the total number of recordings per category, intra-group consistency is still above the minimum limitations for studying verbal behavior.

Summary

The second field test group consisted of fifteen members of the summer school staff of the Chesapeake, Ohio School System, including thirteen teachers, one counselor, and one principal. Every member of the staff expressed a willingness to participate in the study by devoting one hour per week for ten weeks to the study of self-instructional modules dealing with Flanders System of Interaction Analysis.

Data collected from the second field test group were considered to be descriptive of the performance characteristics of the self-instructional modules that were developed. The data were of two types: subjective observations noted or audio-taped by the group and performance scores on the criterion test.

The subjective observations of the second field test group were positive, pointing to the efficacy of the interaction analysis process as a self-study tool for classroom teachers and to the techniques employed in the self-instructional program.

The more objective data collected by the criterion test were analyzed and reported as percentage scores. Results of the test were further analyzed by grouping test items relative to the major divisions of the self-instructional modules. The second field test group scored at a mean percentage level of 84.4.

Basic processes involved in the use of interaction analysis were also examined. The performance of the group in plotting a matrix was measured and compared to preestablished terminal behaviors. These performances fell within the minimum and maximum limitations.

The accuracy and timing of the classification process was tested. Study participants again performed within an acceptable range of plus or minus 10 percent.

Finally, the Scott pi coefficient was employed to examine the inter-group consistency of the skill levels developed by the self-instructional modules.

Table 4

Accuracy of Matrix Plotting
Second Field Test Group

Terminal Behavior	Number of Successful Performances	Per Cent of Performances Correct
1. Be able to transfer original record of verbal behavior to a matrix with no more than 5 per cent error.	15	100
2. Be able to accurately determine the total number of tallies per column on the matrix.	15	100
3. Be able to calculate the percentage of tallies in a column of the matrix as related to the total tallies on the matrix.	14	93.3
4. Be able to calculate the per cent of teacher talk as related to the total tallies on the matrix.	13	86.7
5. Be able to calculate the per cent of teacher talk that is direct and the per cent of teacher talk that is indirect.	14	93.3
6. Be able to calculate the per cent of pupil talk as related to the total tallies on the matrix.	13	86.7
7. Be able to calculate the ratio of indirect teacher talk to direct teacher talk.	14	93.3
8. Be able to calculate the revised i/d ratio.	13	86.7

Table 5

Number of Recordings by Category

Second Field Test Group

Rater Number	Number of Recordings by Category										Total Recordings
	1	2	3	4	5	6	7	8	9	10	
	Standard										
	0	3	10	24	18	1	0	42	14	3	115
1	2	0	11	21	16	4	0	20	43	2	119
2	0	13	5	9	25	2	0	57	0	1	112
3	1	0	14	9	16	3	0	42	18	4	107
4	1	5	9	24	20	0	0	63	13	2	137[a]
5	0	0	11	24	18	0	0	62	6	4	125
6	0	0	11	14	22	0	0	46	13	3	109
7	0	0	16	25	19	0	0	31	13	2	106
8	0	0	12	16	17	1	0	32	23	3	104
9	0	4	25	7	19	0	0	58	17	1	131[a]
10	0	0	11	20	16	0	4	63	13	0	127
11	0	0	18	18	17	0	0	52	15	2	122
12	0	3	19	16	13	0	0	40	11	3	105
13	0	3	9	12	17	1	1	54	9	3	109
14	0	5	12	15	17	0	0	48	20	4	121
15	0	3	7	19	16	0	0	36	23	3	107

[a]Raters number 4 and 9 are the only two with a total number of categorizations falling without the plus or minus 10 percent range (103-127).

Figure 2
Matrix of Scott's Pi Coefficients of Inter-Observer Agreement in Categorizing Test Tape

Second Field Test Group

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	E
1	-	.63	.67	.69	.65	.71	.68	.65	.71	.69	.68	.69	.72	.73	.69	.71
2		-	.63	.66	.71	.69	.68	.67	.66	.71	.68	.69	.73	.68	.63	.65
3			-	.67	.71	.70	.67	.69	.73	.69	.73	.76	.68	.71	.77	.72
4				-	.74	.67	.73	.72	.68	.71	.73	.75	.69	.73	.71	.68
5					-	.75	.72	.73	.73	.73	.75	.69	.73	.72	.79	.72
6						-	.73	.75	.73	.73	.72	.74	.76	.69	.72	.77
7							-	.77	.71	.72	.73	.78	.72	.75	.78	.71
8								-	.71	.73	.72	.75	.73	.78	.81	.70
9									-	.68	.73	.71	.69	.72	.67	.65
10										-	.77	.71	.69	.73	.72	.69
11											-	.73	.68	.74	.69	.70
12												-	.79	.72	.77	.75
13													-	.74	.72.	.71
14														-	.75	.78
15															-	.77
E																-

Average of .72

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary of the Design and Procedures

This study was designed to develop a series of self-instructional modules to teach inservice teachers the Flanders System of Interaction Analysis. Members of the target population, inservice teachers, volunteered to participate in the developmental and validation phases of the study.

The developmental stage was characterized by the construction of preliminary sequences, or instructional modules, in accordance with the most reasonable information available in the research. These modules were then modified on the basis of feedback from a panel of experts and random trials with inservice teachers. This process of sampling and revision was pursued until the point had been reached where additional editing did not appreciably alter the form of the modules.

The validation testing stage was characterized by a sampling of the self-instructional modules to two field test groups composed of inservice teachers. The first field test group consisted of six members of the staff of Kellogg Elementary School in Wayne County, West Virginia. The second field test group was composed of fifteen members of the summer school staff of the Chesapeake, Ohio School System. Part of the data collected were both subjective and "clinical" in the sense that they were the result of close observation of, and interaction with, members of the first field test group. Most of the data collected in this stage, however, constituted a description of the performance characteristics of the self-instructional modules. These data were collected by means of a criterion test.

Summary of the Results

The success of this endeavor was to be determined by the achievement of the participants in the second field test group. Performance criteria for the participants were previously selected and have become the basis for the organization of this part of this chapter.

As a result of exposure to the self-instructional program teaching the Flanders System of Interaction Analysis, participants in the second field test group should:

1. Be able to recognize the purposes of interaction analysis when stated on an objective examination.

All inservice teachers in the second field test group recognized the basic purpose of interaction analysis as an aid to the teacher in studing and evaluating his own classroom behavior, and possessing efficacy in an inservice situation. Eighty percent of the second field test group indicated that the act of teaching should be studied in its natural habitat, the public school classroom. On the basis of performance, this behavioral objective was judged by the researcher as having been met.

2. Be able to classify from memory selected verbal interaction using the Flanders System of Interaction Analysis at a 90 percent level of accuracy.

The criterion test that was administered to the second field test group contained 10 statements for the participant to classify. The group classified incorrectly eleven of the possible number of 150 correct responses to score at a rate of 92.7 percent. In addition the group categorized an audio-taped classroom situation for a period of time slightly in excess of 5 minutes. The average number of total categorizations by a panel of 3 experts was 115 for the tape. A 10 percent error range established the minimum and maximum limits at 103 to 127. Two of the participants failed to achieve within these limitations, both recording above the maximum at 131 and 137.

Accuracy of the classifications made by the second field test group was also compared to the classifications by the panel of experts by using Scott's pi coefficient. These coefficients range from .65 to .78, all indicating a skill level adequate for studying classroom verbal behavior by teachers and students.

On the basis of these data, this behavior objective was judged to have been satisfactorily achieved by the second field test group.

3. Be able to identify selected situational variables that should be noted prior to taking interaction analysis.

This behavioral objective was examined by the criterion test. Of the 15 members of the second field test group, 73.4 percent identified the subject area, grade level, ability level, and achievement level of the class of pupils involved as situational variables that may possibly influence the interpretation of the completed matrix. On the basis of these data, this behavior objective was judged to have been met.

4. Be able to apply the "ground rules" for taking interaction analysis.

Data relative to this behavioral objective were collected in two ways: the criterion test and the actual taking of interaction analysis. Three items on the criterion test examined the knowledge of the ground rules. Of the forty-five correct responses possible, the total group responded correctly in 82.2 percent of the cases. Participants recognized that each change in verbal activity should be recorded regardless of the frequency of this change and easily identified those types of activities that are inappropriate for analysis. Approximately one-fourth of the participants failed to see that statements made by the teacher should be classified on the basis of possible effect upon the pupil and **not** by the intent of the teacher.

Other ground rules for the Flanders System of Interaction Analysis establish procedures for the process of recording the classifications of verbal behavior. A part of the criterion test asked the participants to classify an audio-taped classroom session. This gave each examinee opportunity to apply the ground rules. The researcher examined the original recording of this verbal interaction and found no major violations of the recording procedures.

On the basis of these data, the researcher judged this behavioral objective to have been satisfactorily achieved.

5. Be able to record classroom verbal interaction at three-second intervals or at a rate of between 17 and 22 categorizations per minute.

Members of both field test groups expressed some early fears for perfecting the skill of categorizing at three-second intervals. However, the use of the metronome on the training tapes seemed to allay these fears and proved to be a useful training technique. Five of the six participants in the first field test group perfected the timing of the categorization process to meet the behavioral objective. Thirteen of the fifteen members of the second field test group perfected the timing of the categorization process to meet the standard of plus or minus 10 percent error, a standard even more difficult to attain than that established by the behavioral objectives. On the basis of these data, this behavioral objective was judged to have been achieved.

6. Be able to transfer original recordings of verbal behavior to an interaction analysis matrix with no more than 5 percent error.

Every member of the second field test group succeeded in plotting a matrix with no more than 5 percent error between the numbers of original recordings and the number of tallies on the matrix. This performance indicated an understanding of the concept of applying the principle of "overlapping pairs" to identify the particular cell on the matrix to receive the tally and to maintain the sequence of the data, a factor that aids in interpretation. Ninety-three percent of the participant responses to those items relative to matrix plotting indicated an understanding of the cellular structure of the matrix and its usefulness in showing a "graphic picture" of verbal behavior.

These data led the authors to judge that this behavioral objective had been attained.

7. Be able to accurately determine the total number of tallies per column on the matrix.

Every member of the second field test group succeeded in determining the total number of tallies per column and row of the matrix and testing the accuracy of the number of tallies actually transferred to the matrix.

These data led the authors to judge that this behavioral objective had been satisfactorily achieved.

8. Be able to calculate the percentage of tallies in a column of the matrix as related to the total number of tallies on the matrix.

As shown by Table 4, fourteen of the fifteen members (93.3) of the second field test group succeeded in accurately calculating column percentages. Those errors that were made were mathematical miscalculations rather than errors of procedure.

On the basis of these data, the authors judged this behavioral objective to have been met.

9. Be able to calculate the percentage of teacher talk as related to the total number of tallies on the matrix.

This objective calls for a simple mathematical calculation: dividing the total number of tallies in columns 1-7 by the total number of tallies on the matrix. Thirteen of the fifteen members (86.7 percent) succeeded in correctly determining this percentage. Again the errors were attributed to miscalculations rather than procedure.

On the basis of these data, the researcher judged this behavioral objective to have been satisfactorily achieved.

10. Be able to calculate the percentage of teacher talk that is direct and the percentage of teacher talk that is indirect as related to the total teacher talk.

This behavioral objective called for the examinee to divide the total number of tallies in columns 5-7 by the total number of tallies for columns 1-7 to determine the percentage of direct teacher talk; and, to divide the total number of tallies in columns 1-4 by the total tallies for columns 1-7 to determine the percentage of indirect teacher talk. Fourteen of the fifteen members of the second field test group succeeded in accurately completing these calculations.

On the basis of these data, this behavioral objective was judged by the authors to have been satisfactorily achieved.

11. Be able to calculate the percentage of pupil talk as related to the total number of tallies on the matrix.

This behavioral objective provided that the examinee should divide the total tallies for columns 8-9 by the total number of tallies on the matrix. Thirteen of the fifteen members of the second field test group accurately completed this calculation. Again the errors that were made were not attributable to the procedure employed.

On this basis, this behavioral objective was judged to have been achieved.

12. Be able to calculate the ratio of indirect teacher talk to direct teacher talk.

This behavioral objective provided that the examinee should divide the total tallies in columns 1-4 by the total tallies in columns 5-7. Fourteen of the fifteen members (93.3 percent) of the second field test group succeeded in accurately completing the calculation. Again the lone error was attributable to a miscalculation rather than procedure.

While the process of the behavioral objective was satisfactorily attained, 40 percent of the group seemed to lack an understanding of the concept of indirect/direct ratio. Some viewed it as indicating the number of new ideas presented rather than an indication of whether the teacher was more direct or more indirect for that particular lesson.

13. Be able to calculate a revised indirect/direct ratio.

This behavioral objective called for the participant to divide the total tallies of columns 1-3 by the total tallies in columns 6-7. Thirteen of the fifteen participants (86.7 percent) succeeded in accurately completing this calculation.

Again that performance of the second field test group would warrant judging the behavioral objective to have been achieved, but other data revealed that the groups lacked a clear understanding of the meaning of the concept of revised indirect/direct ratio.

While the indirect/direct ratio does give some indication of the type of talk employed by the teacher for a particular matrix, it is an indication of more than this. Columns 4 and 5, which are a reflection of the teachers' use of the subject content, are disregarded in calculating the revised indirect/direct ratio. The teachers' use of columns 1-3 and 6-7 give an indication of the method of motivation and control employed for any one particular matrix. The data indicated that 60 percent of the second field test group could not make this distinction, making it synonymous with indirect/direct ratio.

14. Be able to identify and interpret the meaning of the following areas of the matrix:

a. steady state cells
b. transitional cells
c. content cross
d. extended indirect influence
e. extended direct influence
f. student talk following teacher talk
g. teacher response to student talk
h. silence or confusion

The criterion test provided that each participant of the second field test group interpret the meaning of loadings of tallies in the general areas of the matrix identified in this objective. These 8 items offered the 15 participants an opportunity to respond correctly 120 times. In reality 91 (or 75.8 percent) of the responses were correct. A further analysis of the criterion test data showed that the general areas identified as steady state cells, transitional cells, content cross, extended indirect influence area, and the silence or confusion area were interpreted correctly by the total group 88 percent of the time.

The area that proved to be the most difficult for the test group was that identified as teacher response to student talk area or rows 8 and 9 from column 1 to 7 on the matrix. Only 40 percent of the respondents correctly identified this area.

Second most difficult was the area identified as the extended direct influence area incorporating cells 6-6, 7-7, 7-6, and 6-7. Sixty-seven percent of the respondents correctly identified this area.

Though two areas of the eight caused some difficulty for the second field test group, the data have been judged by the authors to indicate satisfactory achievement for this behavioral objective.

15. Be able to identify patterns or models of verbal behavior as recorded on the matrix.

Data presented in Table 3 indicated that all participants in the second field test group were asked to interpret a matrix in terms of a model that is represented by a significant number of tallies in various cells of the matrix. For the total group, participants had an opportunity to make 75 correct responses. The researcher judged 60 (80 percent) of these responses to be adequate. Examinees were able to look at the matrix and follow the sequential pattern, which is generally circular, in identifying a model representing the verbal behavior pattern of the teacher and pupils.

On the basis of these data, the authors judged this behavioral objective to have been attained.

16 Be able to make at least five (5) hypotheses about the verbal interaction that is pictured on any given matrix and to support these hypotheses with specific references to the matrix.

Judgments regarding this objective were necessarily subjective because of the hypotheses that were received from the second field test group. It was the judgment of the authors that only one member of the second field test group failed to state any hypotheses that logically developed from the data contained on the matrix.

The participants recognized the pattern of verbal behavior as a discussion lesson characterized by short questions, probably factual, with both short and lengthy answers offered by students. Participants noted that students felt free to respond openly with lengthy answers. The teacher used no criticism but always accepted or praised student responses. Lecture was employed sparingly to support classroom activities.

On the basis of the hypotheses offered, the authors judged that the behavioral objective had been satisfactorily attained.

In summation, the major purpose of this study was to develop a self-instructional program to teach the Flanders System of Interaction Analysis to inservice teachers so that they might be able to examine their own classroom performance through the use of a direct observation technique. Accordingly, the success of this venture was to be judged by the performance characteristics of the material with the second field test group who participated in the validation testing stage of the project. Sixteen performance or behavioral objectives were developed with the aid of the panel employed in the study. The data were analyzed and judged by the standards established by the behavioral objectives.

The authors judged that the performance standards established by all sixteen of the behavioral objectives were met. In only three instances (objectives 12, 13 and 14) were there any doubts. In these cases the members of the second field test groups seemed to be able to perform the processes called for by the Flanders System of Interaction Analysis, but may have lacked a depth of understanding regarding the output of the process. These instances, however, hardly warrant a de-emphasis of the contribution the program may make to inservice education.

Conclusions

1. It is contended that there is a third stage to the development of self-instructional materials, the extension or utilization stage, which is endless. It should occur every time the materials are used in the field. Obviously, data from two field test groups are not sufficient for judging the performance characteristics of any self-instructional program. It is concluded that field testing is more a continuous process than generally believed.

2. The enthusiasm which characterized the responses of members of each of the field test groups would seem to warrant the use of direct observation techniques in inservice education programs. Direct observation with interaction analysis permitted the study participants to view their classroom performances with a precision that they had never known before. The "novelty" of the system did not seem to wane during the course of the field test. On this basis, it is concluded that learning to collect objective data about questions, the use of verbal reinforcement, techniques for motivation, etc., contributes to classroom teachers becoming more aware of their possible effects on the behavior of students.

FIRST SESSION

Objectives

The following objectives are given as a guide for you in studying the first session. Look over the objectives carefully so that you will have a clear understanding of what is expected of you. After completing the first session, come back to these objectives and make judgments regarding the extent of your achievement. If you are not satisfied with your level of competence, go over the material in the first session again. Feel free to discuss the first session with those persons who may be studying interaction analysis with you.

1. Be able to define interaction analysis to another person.
2. Be able to explan the purposes of interaction analysis as stated in the first session.
3. Be able to classify selected teacher statements by the major divisions of teacher talk, both direct and indirect.
4. Be able to classify selected pupil statements by the major divisions of pupil talk, teacher initiated pupil talk, and pupil initiated talk.

This session is designed for approximately one hour of study.

Introduction

Have you ever stopped to analyze the effect that your classroom behavior has on the students that you teach? Have you, as a classroom teacher, ever analyzed how you react verbally to student ideas? Have you ever thought that your verbal behavior for a specific lesson might be analyzed and compared with the plans you had made before teaching the lesson? You are aware that much of what is studied in education courses does not lend itself to answering these types of questions. One thing is certain. There is a need to study the act of instruction in its natural setting, the classroom. From this experimentation a set of principles that will aid in understanding the process of instruction needs to be drawn.

Perhaps an analogy used by Gage[1] will help you to understand this point. Farmers need to know something about how plants grow, and how they depend upon soil, water, and sunlight. So teachers need to know how children learn, and how they depend upon motivation, readiness, and reinforcement. But farmers also need to know how to till the soil, put in the seed, get rid of weeds and insects, harvest the crop, and get it to market. If the analogy applies at all, then teachers similarly need to know how to motivate the student, how to assess readiness, how to act on the assessment, how to maintain discipline, and how to structure the subject matter presented. Educational psychology might lead the teacher to infer what he needs to do from what he is told about learners and learning. A theory of instruction would make explicit how teachers behave, why they behave as they do, and with what effects.

All this is not to deny that research is being done. But, much of what is being done deals only with content and sequence or with an adjustment of time, space, and use of personnel. You, as a classroom teacher, know that significant change can only be brought about by improvements in the performance of the act of teaching.

The purpose of this self-instructional package that you have been given is to help teachers and others concerned with the teaching-learning process to gain insights that will help to improve teacher effectiveness. The emphasis here is on the fact that *you* may study *your own* performance and make judgments that *you* consider appropriate. To attain this objective, major emphasis is given to the system of interaciton analysis that was developed by Ned Flanders at the University of Minnesota. The package describes what are considered to be conditions and tools necessary for a teacher to examine his own classroom behavior and thereby accurately define and graphically illustrate his concept of what the instructional process ideally ought to be and subsequently modify his behavior in the direction of that ideal.

It should be stated at the outset that certain conditions must be present for a teacher to understand and perhaps improve classroom performance. Only *you* can make changes in your classroom behavior. Therefore, the desire to understand and improve one's own behavior is one of these conditions. You must also be willing to put forth the time and effort required to look objectively at classroom performance and to accept professional guidance.

While this package is a part of a planned inservice program, the fact that it is self-instructional means that you are largely on your own. Attempt to develop within yourself, or with another classroom teacher with whom you may choose to work, a climate for acceptance and support. In this way, you can accept information that you gather about your classroom behavior without becoming defensive and you can be free to experiment with new approaches without fear of criticism. At all times you should try to maintain an open mind.

At this point you may wonder why a teacher should study his own classroom behavior. The primary responsibility of the classroom teacher seems to be the guidance of learning activities for children. As he guides and as he structures situations to which the child can respond, the teacher interacts with the entire class both as individuals and as a group. In the process of this interaction, that most often takes the form of verbal communication, the teacher influences the children in some way. But, is the teacher always aware of the nature of this influence? By studying your behavior in the systematic and objective manner described in this package, you can gain insight in-

[1]N. L. Gage, *Handbook of Research on Teaching* (New York: Rand McNally Book Company, 1963), p. 133.

to your pattern of influence. As you gain these insights, you may decide, as many teachers have decided, that you want to change your classroom behavior.

Any system for reporting descriptive data about instructional performance back to the teacher involved is known as feedback. The procedure described in this package is a feedback system that has been found to be an effective means for supplying a teacher with objective data about classroom performance. You may study *your own* performance in this manner and feel free to make *your own* judgments about your findings.

Flanders System of Interaction Analysis

One of the first questions that has probably occurred to you is, what is interaction analysis? Briefly stated, we can say that it is a process whereby the verbal behavior exhibited in a classroom by the teacher and pupils can be objectively recorded, classified and preserved for future analysis. Further, the verbal behavior is recorded in a timed, sequential manner.

All of us in teaching have at one time or another left the classroom or school at the close of a day feeling that we really did not accomplish our goals. We have thought about this, but we had no tool or device to provide us with objective information from which we might be able to analyze the difficulty. The Flanders System of Interaction Analysis will provide for you a "picture" of your verbal classroom behavior or performance and the "picture" will allow you to compare your performance with your intentions under classroom conditions. The use of interaction analysis will provide you with objective information about your classroom behavior within one hour of its occurrence. In other words, the use of interaction analysis allows you to view your classroom performance in light of what you intended to do. It should be pointed out that this is not a diagnostic system, but instead a system that objectively describes your classroom behavior. You as a teacher can look at your behavior in the manner that a coach analyzes the behavior of his players from studying a frame or frames of a movie taken under game or play conditions.

Interaction analysis is a skill and can be learned like any other acquired skill. The effective use of an overhead projector is a skill-type learning. The first attempt to use an overhead projector can be and is quite often "amateurish." However, after considerable practice with it and its operation, a high level of proficiency can be reached. The average teacher can learn the basic skills involved in interaction analysis in eight to ten hours of study. Obviously, more skill and expertise can be developed when a larger block of time is spent in studying the system.

The use of interaction analysis will serve and benefit you only to that degree you are willing and able to examine your own performance. You must voluntarily want to put your teaching behavior before the camera and analyze the "picture." Remember that you are to analyze the "picture" of your performance as compared to your intentions.

If you are ready to proceed, it appears imperative that you learn and understand the techniques of the system. The Flanders System is concerned with *verbal behavior only*. It is assumed that verbal behavior is an adequate sample of your total behavior that will provide you with an excellent "picture" of your classroom performance. It was stated above that we will record and classify the verbal behavior emitted in a classroom situation. In order to accomplish this, we must be able to assign categories for different types of verbal behavior expressed in the classroom. Let us look at the first major area of this system, the verbal behavior of you, the teacher. All of your statements may be classified as *indirect* or *direct*. This gives a "picture" of the degree of freedom you permit the pupils. In other words, you have a choice in any given situation. If your statements are *direct*, you are reducing the freedom of the pupils to respond. If your statements are *indirect*, you are increasing the freedom of the pupils to respond. Your choice may have been conscious or unconscious; that is, your choice may have been explicitly stated in your goals for a given learning situation or may have just happened.

In order to encompass all verbal classroom behavior, the second major area of the Flanders System permits us to record pupil talk. A third major area, that of silence and/or confusion, is included to allow the classification of all other behavior that cannot be classified as teacher talk or pupil talk. You can now see that we have three major categories for the system:

(1) teacher talk
(2) pupil talk
(3) silence or confusion

These larger sections of teacher and pupil talk are subdivided so that the total pattern of teacher-pupil verbal interaction is more meaningful. Teacher talk is divided into or assigned seven categories. The first four categories consist of indirect teacher statements: (1) accepted feeling; (2) praising or encouraging; (3) accepting ideas; and (4) asking questions. The next three categories include direct teacher statements: (5) lecturing; (6) giving directions; and (7) criticizing or justifying authority.

The pupil talk is divided into only two classifications: (8) responding to teacher and (9) initiating talk. The last category, number 10, includes all classroom behavior that cannot be classified in any of the other nine categories: silence, noise or confusion.

The following is a discussion or description of the types of verbal behavior that may be assigned to each category. It is absolutely essential that you familiarize yourself with the types of verbal behavior that should be assigned to any given category. However, you are not expected to do this on the first reading. There is a summary of the categories at the end of this session that you may copy for further study and memorization.

Listed below are the ten categories and code numbers of the Flanders System of Interaction Analysis:

Category 1, *Clarification and/or Acceptance of Pupil Feeling*

Statements by the teacher that denote an understanding or acceptance of how the pupils feel are included in this category. All teacher statements that deal with pupil emotions and feelings in a non-critical manner; that imply that the pupils have a right to have these feelings; and that produce a completely threat-free situation are categorized here. These kinds of statements may recall past, present, or future feelings that have either positive or negative connotations. Typical statements might be: "Charles, I know you are upset due to the illness of your sister, but see if you can solve the next problem." "Yes, Bill, I am excited about the game tomorrow, too; but . . ."

Category 2, *Praise, Reward or Encouragement*

Teacher statements that may be classified here are often just one word: "right," "excellent," or "fine." A teacher may say, "That looks good." Other related type statements that are used to encourage either present or future pupil performance might include such statements as: "You are making a good start." "Yes, go ahead with what you are saying." "Uh huh; continue; tell us more." "O.K., that is good." "O.K., go on." Included in this one category are jokes that relieve tension, but not those that threaten or ridicule pupils. Generally, all teacher statements that please, reward or encourage current, previous or predicted future pupil behavior should be classified under this category.

Category 3, *Accepting Pupil Ideas*

This category is sometimes confused with Category 1. However, it includes only *acceptance of pupil ideas,* not acceptance of expressed feeling or emotion. The teacher may simply accept the pupil's idea, paraphrase the idea, restate the idea more clearly or summarize the remarks of the pupil. The teacher may say, "Yes, that is interesting, and I see what you mean." The teacher may say "O.K.," and then clarify the pupil's statement. This is probably one of the most difficult categories of the system. One has to be careful to note that the teacher often shifts from the pupil's idea to his own which is recorded in another category. Teacher statements which are designed to aid the pupil in thinking through what he has said or done are included here also.

Category 4, *Asking Questions*

Included in this category are teacher questions to which an answer is expected from the pupils. These teacher questions may be broad and elicit class discussion or narrow and may be answered in one word. Such questions may be about content, procedure, or may ask for pupil opinion. Many times a teacher will ask a question and then follow it with a statement or lecture. It is obvious that no answer was expected from the pupils and, therefore, this category is not used. A rhetorical question is not categorized as a question. Remember, you categorize 4's only when it is clear that the teacher has asked a question and a pupil response is expected.

Category 5, *Lecture*

This category includes all statements regarding content or process that give information or opinion. Fives are recorded whenever the teacher is explaining, discussing, giving opinion, or giving facts or information. Rhetorical questions are also included in this category.

Category 6, *Giving Directions and Commands*

Any statement by the teacher that includes directions, requests, and commands to which compliance is requested is to be included in this category. These types of statements may be general such as, "Will all of you stand?" or they may be more restrictive such as, "Sam, bring your book to my desk."

Category 7, *Criticizing or Justifying Authority*

A teacher statement that is designed to change non-acceptable pupil behavior to acceptable behavior may be termed as criticism. These types of statements may simply be: "no" or "that is wrong." Teacher statements of defense, self-justification, explanation of himself or his authority, or constantly asking pupils to respond as a special favor are all inclued in this category. Any teacher statement that criticizes or rejects pupil ideas or behavior, and/or rejects pupil feelings are also included in this category.

As you know, criticism may be constructive or destructive. No distinction is made by the system when categorizing. Neither should you draw the conclusion that criticism is bad by its very nature. The major criterion for categorizing a statement by the teacher as a "7" is whether or not it restricts the behavior of the student.

Category 8, *Pupil Talk-Response*

All pupil talk that is clearly initiated by the teacher is included in this category. If the pupil is responding to a question asked by the teacher or if he responds verbally to a direction given by the teacher, the pupil talk is recorded here.

Category 9, *Pupil Initiated Talk*

In general, any pupil talk not prompted by the teacher may be placed in this category. If a pupil raises his hand to make a statement or to ask a question when there has

been no teacher prompting, the appropriate category is 9. Also, if a pupil gives an answer different from that expected for a particular question, then the pupil statement is categorized as a 9.

A student may extend his answer to a question phrased by the teacher by interjecting his own ideas. In this case, the pupil would have begun as Category 8 and then shifted to Category 9 as he begins to project his own ideas.

Category 10, *Silence or Confusion*

This category takes care of anything that cannot be included in the other nine categories. Any periods of silence, seat work, or periods of confusion in communication when it is not possible to determine who is talking, are classified as 10's. If several pupils are attempting to talk simultaneously, 10's are recorded.

As stated earlier, it is absolutely essential that you become able to associate the above categories with their code numbers immediately. You must be able to do this prior to beginning the next session. Perhaps it would be wise if you stopped at this point and turned back to Category 1 and read through the categories very carefully.

If you have done this you are ready to proceed. Obviously, you have to practice if you expect to associate the code numbers with the assigned categories. A good technique to use is to begin to think in terms of the code numbers. In any group situation you can assign the role of teacher to a given person and mentally record the verbal behavior. If the person is criticizing, you can mentally classify his statements as 7's and so on with each category. Remember it is important that you think of verbal behavior in terms of the code numbers outlined above.

A summary of the categories for Flanders System of Interaction Analysis with brief definitions is given in Figure 3 (summary page of categories). It is strongly suggested that you keep a copy of Figure 3 with you for continued study. Do not overlook the major divisions of teacher talk, student talk, indirect influence of the teacher and direct influence of the teacher. Remember there is no short cut to this part of the program. If you are to proceed with the program, you must be able to associate code numbers with the proper categories instantly. A little extra effort on your part now will gain great dividends for you and your pupils later. Your progress in learning the system will be enhanced in proportion to your ability to make associations between categories and code numbers prior to beginning the second session.

Figure 3

Summary of Categories for Interaction Analysis

TEACHER TALK	INDIRECT INFLUENCE	1.	ACCEPTS FEELING: accepts and clarifies the feeling tone of the students in a non-threatening manner. Feelings may be positive or negative. Predicting and recalling feelings are included.
		2.	PRAISES OR ENCOURAGES: praises or encourages student action or behavior. Jokes that release tension, not at the expense of another individual, nodding head or saying "uhhun?" or "go on" are included.
		3.	ACCEPTS OR USES IDEAS OF STUDENT: clarifying, building, or developing ideas or suggestions by a student. As teacher brings more of his own ideas into play, shift to category 5.
		4.	ASKS QUESTIONS: asking a question about content or procedure with the intent that a student answer.
	DIRECT INFLUENCE	5.	LECTURES: giving facts or opinions about content or procedure; expressing his own idea; asking rhetorical questions.
		6.	GIVES DIRECTIONS: directions, commands, or orders with which a student is expected to comply.
		7.	CRITICIZES OR JUSTIFIES AUTHORITY: statements intended to change student behavior from non-acceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing, extreme self-reference.
STUDENT TALK		8.	STUDENT TALK-RESPONSE: talk by students in response to teacher. Teacher initiates the contact or solicits student statement.
		9.	STUDENT TALK-INITIATION: talk by students, which they initiate. If "calling on" student is only to indicate who may talk next, observer must decide whether student wanted to talk. If he did, use this category.
		10.	SILENCE OR CONFUSION: pauses, short periods of silence, and periods of confusion in which communication cannot be understood by the observer.

Figure 4

Recording Sheet

Name_____ Date_____

Record of situational variables: (1) Grade level_____; (2) Subject area_____;

(3) Class ability level_____; and (4) Class achievement level _____

1.										
2.										
3.										
4.										
5.										
6.										
7.										
8.										
9.										
10.										
11.										
12.										
13.										
14.										
15.										
16.										
17.										
18.										
19.										
20.										

Additional remarks: _____

SECOND SESSION

Objectives

The following objectives are given as a guide for you in studying the second session. Look over the objectives carefully so that you will have a clear understanding of what is expected of you. After completing the second session, come back to these objectives and make judgments regarding the extent of your achievement. If you are not satisfied with your level of competence, go over the material in the second session again. Feel free to discuss the second session with those persons who are studying interaction analysis with you.

1. Be able to *identify* selected situational variables that should be noted prior to taking interaction analysis.

2. Be able to state the purposes for noting or recording situational variables prior to taking interaction analysis.

3. Be able to apply the "ground rules" for taking interaction analysis as stated in the second session.

4. Be able to associate the categories of verbal behavior of the Flanders System of Interaction Analysis with their code numbers from memory.

The session is designed for approximately one hour of study.

Techniques for Recording Teacher-Pupil Verbal Behavior

Now that you are able to associate specific examples of classroom verbal behavior with Flanders categories, it is time to consider the procedure for making a record of this verbal interaction. As described in this package, interaction analysis is meant to be used as an inservice education device for teachers. It is equally valuable as a feedback system when employed by a teacher as he observes someone else or as he categorizes a tape recording of his own classroom behavior. The procedures are always the same.

First, you should spend five or ten minutes just listening, while orienting yourself to the situation that you plan to categorize. This orientation period will help you get a "feeling" for the type of verbal interaction that is taking place. You should do this for a live classroom being observed or for a tape recording.

Secondly, at the end of each three-second period, decide which of the ten categories best represents the verbal interaction just completed. Record these numbers in sequence in a vertical column while simultaneously assessing the verbal interaction in the next three-second period. This means that you will write approximately 20 numbers per minute and, after several minutes, you will have several long vertical columns of numbers. It is important to note that this original sequence of numbers representing the categories of interaction analysis must be preserved.

There are additional hints that you may find helpful at this point. Why not mark your paper for recording in columns of 20. Thus, each column represents approximately one minute of interaction. This arrangement also facilitates counting the total number of categorization that you have made.

You may also be wondering why you record at three-second intervals. In the research to develop the system, Flanders found this to be the optimum interval for maintaining accuracy while making a record of all the verbal interaction taking place. At first you will find it difficult to maintain a steady tempo of recording. However, the use of a stopwatch or the second hand on your watch will help. You may want to have another person time you. In addition, tapes that will be used in later sessions are designed to help you perfect timing.

It should also be stated at this point that this record of the verbal interaction is useful only to the degree that you can use it later to analyze your verbal performance. To make this analysis, there are certain "situational variables" that you should carefully note on the same paper on which you record the sequence of category numbers. Such variables as grade level, subject area, and ability and achievement levels of the class being observed, are pertinent to an adequate recall and interpretation of the total experience. Do not attempt to recall these from memory later. You should make a written record.

Since interaction analysis is designed only for making a record of verbal behavior, all non-verbal types of classroom activities are inappropriate for recording. Such activities as workbook assignments, supervised study periods, silent reading, laboratory work, and seat work are all inappropriate for recording. When the nature of the classroom activity changes so that the recording of interaction analysis is inappropriate, you should draw a double line at that point in the sequential listing of categories and make a marginal note of the type of activity taking place. You may resume categorizing when the total class discussion continues and after the identifying notes have been made. Remember this, however, all verbal activities are appropriate for recording and will fit into one of the ten categories of the Flanders System of Interaction Analysis.

In addition to these general concerns for timing and sequence, there are other specific "ground rules" that you should observe when recording:

1. *If more than one type of verbal activity occurs during any three-second period, then all categories used are recorded.* In other words, record each change of category regardless of the frequency of occurrence. If no change occurs during the three-second period, you should repeat the previous cate-

gory number recorded. Observance of this rule means that during periods of quick verbal interchange you may record more than 20 categories per minute. It is entirely conceivable that a teacher may ask a question, a student responds, and the teacher praises the student all within a three-second period. Of course you should record such an exchange as a 4-8-2 sequence.

2. If silence is long enough for a break in the interaction to be discernible and if it occurs at the end of a three-second period, it is recorded as a 10. The 10 category is also used when two or more people are speaking at once, making it impossible to identify a single speaker. And, since each classroom session theoretically begins and ends with silence, each "take" of interaction analysis should begin and end with a 10.

3. The observer must not be overly concerned with his own biases or with the teacher's intent. Rather, you should ask yourself the question, "What does this behavior mean to the pupils as far as restriction or expansion of their freedom to respond is concerned?" Remember that the differentiation between direct and indirect verbal behavior of the teacher is one of minimizing or maximizing the student's freedom to respond. As an example of this type of situation, have you ever attempted to use humor in the classroom and have it "backfire"? Normally humor is used to relieve tension and would be recorded as a 2. But if the joke increases tension or if a student who receives the "blunt" of the joke interprets it as criticism or finds it embarrassing, it should be recorded as a 7. A question such as "What do you think you are doing?" has the effect of restricting further action of this type by the student and should be recorded as a 7. *The effect of a teacher's statement on the student,* and not the teacher's intent, *is the crucial criterion for categorizing a statement.*

Ultimately, everything that is done in education must be measured by its benefit to the student. What is the effect of your action on the student? How does the student perceive your action? Using this criterion requires that you be very openminded, especially when you are categorizing a tape of your own classroom performance. You must learn to be non-defensive. Data about your verbal behavior that you collect may reveal significant variation from your intentions. But more important, it establishes the area on which you may begin to work to improve your classroom performance.

4. If the primary tone of the teacher's behavior has been consistently direct or consistently indirect, do not shift into the opposite classification unless a clear indication of shift is given by the teacher. You, as a trained observer, are best qualified to judge whether or not the teacher is restricting or expanding the student's freedom to respond. This word of caution is necessary. If the teacher being observed has been consistently indirect or acceptive of pupil behavior for an extended period of time, a slightly direct statement in this acceptive pattern may appear to be more restrictive than it actually is. In this case, you should be careful about shifting to the direct categories unless a clear sign is given.

While this rule calls for you to react to the general pattern of teacher influence, extreme shifts from one general pattern to another do occcur. You must be ready to change when a teacher moves from a 6 or 7 to a 2 or 3. In interpreting the data, such shifts will indicate to you how effectively you have used criticism.

Specific Aids in Differentiating Among Categories

Though at this point you are familiar with the categories and the procedures for recording interaction analysis, you will find at times that you need additional help in making some of the distinctions in categorizing. This part of the package is included so that the finer points in differentiating between and among categories might be clearly established.

Category 1, Accepting Feelings, Versus Category 3, Accepting Ideas

These two categories sometimes present real problems for the beginning observer. You should remember that Category 1 deals with emotions while Category 3 deals with ideas. If the student exhibits strong emotion, the response of the teacher will probably deal with that emotion. The teacher may respond by reflecting the emotion or by clarifying the emotion. If the emotion is fused with an idea and if the teacher tries to relate the emotion to the idea, then category 1 is used. Suppose that a student says "I see no practical value in studying English History." If the teacher were to respond, "Sometimes a memorization of historical facts does leave us a little discouraged," it should be recorded as a 1 (feeling). On the other hand, if she were to respond, "John has stated a contention of many scholars," you should record a 3.

Category 1, Accepting Feelings, Versus Category 2, Praise or Encouragement

Remember that category 1 does not deal with a value stated by the teacher, while category 2 is a statement of teacher approval. Such short statements as "fine" or "good" should be categoried as a 2. Statements that encourage a student to continue to speak or expand the idea are categoried as 2's.

Category 2, Praise and Encouragement Versus Category 3, Accepting Ideas

To repeat, category 2 is primarily encouragement by the teacher through the use of value judgments. On the other hand, category 3 refers to restatements or clarifications of student ideas. No element of value or praise is present in category 3, as the teacher simply accepts or restates student ideas.

Category 4, Asking Questions, Versus Categories 2, 3, 5, 6, and 7

At times, questions may be categorized in any one of the seven teacher-talk categories. The criterion for the use of category 4 is simply, "Does the teacher expect an answer from the students?" If the teacher expects an answer, the question should be categorized as a 4.

To illustrate the varieties of intent for questions that teachers use, consider the following examples: This question, "What do you think you are doing?" spoken harshly serves to improve undesirable behavior and should be categorized as a 7. A question such as, "Do you like Joe's model as much as I do?" serves to place a value on the model and should be categorized as a 2. Yet this question, "Joe, can you explain this particular relationship in the model?" serves to make use of the student idea; therefore, record a 3. The question, "John, will you sharpen this pencil?" is a direction and should be recorded as a 6.

At other times the teacher may ask questions to arouse the interests of the students and for which no answers are expected. If a teacher phrases a question and then continues talking, it should be recorded as a 5 (lecture).

Category 5, Lecture, Versus Category 6, Giving Directions

In the research that Flanders has done with interaction analysis, he found that the average teacher does two-thirds of the talking that is done in the classroom. It is thus understandable that category 5 is the most used category. When a teacher is communicating his own thoughts, ideas, or opinions, category 5 is used. This is always true unless the teacher is giving directions (category 6) or criticizing (category 7).

The criterion to differentiate between categories 5 and 6 is one of student compliance. If compliance by a student or students is expected, then category 6 is used.

Category 6, Giving Directions, Versus Category 7, Criticizing

The difference between direction and criticism is often difficult to distinguish because they are used together so frequently, falling into a criticism, direction, criticism, direction pattern. You can see this pattern when you give directions and receive no compliance. You then criticize and give further direction and thus establish the sequential pattern.

The statement, "Please sit down," is a direction and should be recorded as a 6. If the teacher says, "I want you to do it this way," you should record a 7 since she is justifying her authority.

Category 8, Student Talk-Response Versus Category 9, Student Initiated Talk

It is sometimes difficult to differentiate between these two categories. In general, questions that are narrow in scope will draw a category 8 response from the student. Broad, open-ended questions are more likely to draw a category 9 response. If in responding to teacher talk the student shifts to his own idea, the observer should shift to category 9. Such shifts are quite common in the average classroom.

Category 9, Student Initiated Talk Versus Category 10, Silence or Confusion

When the students are carrying on a discussion without the teacher intervening, a long series of 9's would normally be recorded. However, to show when a different student begins to speak, a 10 is inserted in the sequence of 9's to indicate that more than one student has been initiating ideas.

The foregoing descriptions have been included here to enable you to be aware of some of the situations you may find in recording the verbal interaction in the classroom.

These descriptive comparisons should prove a further insight toward improving your categorization skills.

It may prove advisable for you to restudy these descriptive statements prior to continuing with the material.

Now that you have completed your study of Session 2, why not go back to the objectives and make judgments regarding your achievement. If you do not feel comfortable with your achievement at this point, perhaps you should spend additional time with the test of Session 2.

THIRD, FOURTH, FIFTH, AND SIXTH SESSIONS

Objectives

The following objectives are given as a guide for you in studying the third, fourth, fifth, and sixth sessions. Look over the objectives carefully so that you will have a clear understanding of what is expected of you. After completing each session, come back to these objectives and make judgments regarding the extent of your achievement. If you are not satisfied with your level of competence, go over the material again. Feel free to discuss each session with those persons who are studying interaction analysis with you.

As a result of working with the tapes for the third, fourth, fifth, and sixth sessions, the teacher would:

1. Be able to make application of the "ground rules" for recording interaction analysis.

2. Be able to record classroom verbal behavior at three (3) second intervals or at a rate of between 17 and 22 categorizations per minute.

3. Be able to record classroom verbal behavior for 10 to 15 minutes at improving levels of accuracy for the total categorization. For the beginner, an error range of plus or minus 20 percent is permissible.

4. Be able to categorize classroom verbal behavior (by category) for 10 to 15 minutes. Practice will permit you to record within a plus or minus 10 percent error range. This should improve your levels of accuracy until the totals for each category fall within the plus or minus 10 percent error range.

THIRD SESSION

Situation I of the Training Tapes

This will be your first opportunity to listen to a recording of a live classroom situation. It is suggested that you spend at least one hour working with Situation I. You may find it more feasible to break the hour into two thirty-minute periods or three twenty—minute periods.

Situation I on the tape recording is introduced by a narrator with specific instructions for you to follow. As you will note from the narrator, you are *not* requested to record the verbal behavior at the beginning of the tape recording. You are instructed to *just listen* and mentally record the verbal interaction taking place. This verbal interaction is frequently interrupted by the narrator to briefly identify and classify the verbal behavior. Later in the tape recording you will be requested to replay the entire tape and actually "take" interaction analysis of the verbal interchange. Remember, you should work with this tape recording at least a full hour to provide you with the training required for you to positively react to the next stage of this material. Some of you may wish to spend even more time with the tape than one hour. This is all right if you have the time. Informational feedback is presented at the end of this tape. This information will allow you to check your timing and accuracy.

You must secure a recorder and make sure it is functioning properly. It is very important that you find a desirable location to work with this tape recording. You should be so located that outside noise is at a minumum and you should take precautions against being interrupted while playing the tape.

After loading the tape in the recorder, there are certain things you should check. First, make sure that the speed of your tape recorder is set a 3 3/4. Secondly, prepare pencil and paper so that you can record the categories of verbal behavior when instructed by the narrator on the tape.

If you are ready, prepare your tape recorder and begin listening as the narrator provides you with details.

FOURTH SESSION

Situation II of the Training Tapes

Situation II is a recording of a classroom discussion which is divided into six one-minute segments and two two-minute segments. The discussion topics are items of interest to students of high school and college age. Once again you should listen to several of the segments of tape included while mentally reacting to the verbal behaviors used. Then rewind the tape to Segment I and begin to record in columns of twenty. The narrator will discuss each segment at its conclusion, suggesting the categories that should have been recorded. Be ready to make a copy of the categories suggested by the narrator so that you can compare these with your recordings for accuracy.

Notice also the clicking of the metronome in the background of this tape. It is set at three-second intervals and should help you to perfect your timing.

Once again you should work with Situation I for at least one hour. However, you may choose to spend this hour in shorter time periods. By all means, perfect your timing and accuracy with this tape before going on to Situation III.

FIFTH SESSION

Situation III of the Training Tapes

Once again you should reserve at least one hour to work with Situation III of the training tapes.

This tape recording was made from a written script. The content of the tape deals with various aspect of interaction analysis as well as providing an opportuity for you for further practice in recording and categorizing verbal behavior.

Notice again the clicking of the metronome at three-second intervals. This is to help you perfect yourtiming.

Listen to a part of the tape while mentally recording the verbal interaction. Then rewind the tape and record in columns of twenty.

At the conclusion the narrator will provide you with the total number of recordings that you should have for each category and the total number of recordings. If you used the metronome in the background, you should be well within the plus or minus 20 percent error limits that is permissible on your first recording. As you practice with this tape, your accuracy should improve so that your total recordings will fall within a plus or minus 10 percent error range. If you are unable to do this, go back to Situation II of the training tapes for more practice with the shorter segments.

SIXTH SESSION

Situation IV of the Training Tapes

Once again you should plan to spend one hour with Situation IV. It is a tape of a guided discovery lesson dealing with the binary number system. The class involved is composed of seventh grade students of above average ability but below average in achievement.

Listen to three or four minutes of the tape first while you mentally react to the verbal behaviors used. Then take interaction analysis, recording in columns of twenty, so that you may easily count the total number of recordings made. After making the first recording, also count the number of recordings for each category. The narrator will give you category totals as feedback for checking accuracy and timing. As soon as you feel comfortable with the level of accuracy and timing achieved, you will be ready to move on to Session Seven. As you may recall from the tape, you are now expected to achieve a higher level of accuracy at this point (± 10 percent).

SEVENTH SESSION

Objectives

The following objectives are given as a guide for you in studying the seventh session. Look over the objectives carefully so that you will have a clear understanding of what is expected of you. After completing the seventh session, come back to these objectives and make judgments regarding the extent of your achievement. If you are not satisfied with your level of competence, go over the material in the seventh session again. Feel free to discuss this session with those persons who are studying interaction analysis with you.

1. Be able to transfer original recordings of verbal behavior to an interaction analysis matrix with no more than a 5 percent error.

2. Be able to accurately determine the total number of tallies per column on the matrix.

3. Be able to calculate the percentage of tallies in a column of the matrix as related to the total tallies on the matrix.

4. Be able to calculate the percentage of teacher talk as related to the total number of tallies on the matrix.

5. Be able to calculate the percentage of teacher talk that is direct and the percentage of teacher talk that is indirect as related to total teacher talk.

6. Be able to calculate the percentage of pupil talk as related to the total number of tallies in the matrix.

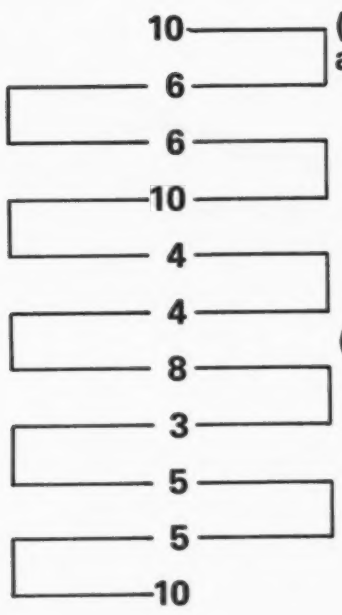
7. Be able to calculate the ratio of indirect teacher talk to direct teacher talk (ID Ratio).

8. Be able to calculate a *Revised ID Ratio* and be able to explain a *Revised ID Ratio* to another person.

SEVENTH SESSION

Matrix Building

You have now learned to associate verbal behavior in the classroom with category code numbers. Also, you have an understanding of the technique for recording this verbal behavior and a knowledge of the ground rules to follow in assigning certain types of verbal behavior in a specific category. All of the previous training you have received can now be applied in such a manner that a "picture" of the classroom performance will become readily apparent to you. As you will recall, when you finish observing and recording the total verbal behavior you have several columns of numbers. You must now transfer these numbers into a matrix (see the following page) made up of ten rows and ten columns, Remember that you learned earlier that Flanders System of Interaction Analysis not only records verbal behavior in an objective manner, but it also records the verbal behavior sequentially. It is important that you maintain this sequence in transferring these code numbers into the matrix. In order to accomplish this, the following example is given:



(The use of a 10 at the beginning and end of the sequence is important as explained earlier.)

(It is important to indicate the numbers by pairs as shown in the example.)

As you can observe from the example above, the numbers have been *paired* and *each number*, except the first and last ten, is *used twice*. With the exception of the first pair of numbers, the second number in each preceding pair of numbers becomes the first number in the following pair of numbers; hence, each pair overlaps the preceding pair. You will use each number twice with the exception of the first and last ten. If you will pair the numbers as shown in the example above you will be less likely to make an error in plotting the matrix. This maintains the sequence of verbal behavior and it also permits you to record in the matrix by simply inserting a tally mark. Each pair represents a specific cell in the matrix which is determined by using the *first number* of the pair to locate the *row* and the *second number* to locate the *column*. *Using this pattern you note the first pair of numbers in* the example is 10-6. In order to record this in the matrix, you use the first number in the pair, 10, and go down the rows until you locate row 10. (Refer to Table 6 on page 46 to see how this plotting has been done on a matrix.) Then note the second number of the pair, 6, and go across until you locate column 6. This is a specific cell in matrix, 10-6, and you simply place a tally mark as shown in Table 6. The second pair, 6-6, would be located in the same manner by locating row 6 and column 6 and placing another tally. The third pair, 6-10, is entered in the matrix by going down to row 6 and across to column 10 and placing a tally mark. The remaining pairs of numbers have been recorded in the sample matrix. Now, you locate the remaining pairs of numbers and see if you agree with the example given.

While the matrix will provide a general picture of the verbal interaction that has taken place, you should also begin to think in terms of specific cells. The matrix contains 100 cells, each having a particular meaning. In the sample matrix shown on page 46 the 10-6 cell represents directions following silence or confusion. The 6-6 cell represents directions of more than three seconds' duration. The 6-10 cell represents silence following directions. Each of the 100 cells can be viewed in this way, and you should begin to think in terms of specific cells.

It is necessary to build a separate matrix for each specific lesson or major activity. If you were to categorize 20 minutes of a mathematics class and 15 minutes of an English class, you should make one matrix for the mathematics class and another for the English lesson. Also, if a teacher has a 20-minute structured lesson followed by a 15-minute free discussion period, it would be necessary to build two separate matrices. Each matrix is meaningful only if it represents a single type of activity or work. However, this is not to be confused with the fact that types of verbal behavior can be recorded in one of the ten categories.

There are several phases in using the matrix to describe the classroom interaction. You should be able to calculate:

(1) the total tallies in each column of the matrix

(2) the percentage of tallies in each column to the total tallies in the matrix

(3) the percentage of time the teacher was talking during the time observation

(4) the percentage of time pupils were talking during the time of total observation

(5) the degree of directness or indirectness of teacher talk

(6) the kind of emphasis given by the teacher to motivation and control in a given classroom.

Table 6

Sample Matrix —

Columns

		1	2	3	4	5	6	7	8	9	10	
	1											
	2											
R	3					1						
o	4				1				1			
w	5					1					1	
s	6						1				1	
	7											
	8			1								
	9											
	10				1			1				
	Total			1	2	2	2		1		2	10
Column %		0	0	10	20	20	20	0	10	0	20	

Now let's look at each of these in a more detailed manner using the example of Table 6.

1. Total tallies per column

The first step in this process, after appropriate tallies have been made in the matrix from the observation sheet, is simply to add the tallies in each column. These sums are recorded in the row captioned "total." At this point you should check the total number of tallies in the matrix with the numbers entered in the orginial observation record. The total number of tallies in your matrix should be one less than the total numbers entered in your original observation record (N-1). In the above example we began with 11 numbers and the total number of the tallies in the matrix is 10 (N=11-1). This number is recorded in the cell that extends to the right of column 10.

2. Percentage of tallies per column

Next, you will need to calculate the percentage of tallies in each column. This is done by dividing the total number of tallies in each column by the total number of tallies in the matrix. Using for an example Table 6, let's calculate the percentage of column four teacher question, to the total statements shown by the matrix. As you notice, there are two tallies is column four and there are ten tallies in the total matrix; therefore, you divide the number of tallies in column four, two, by the total number of tallies in the matrix, 10. The percentage of tallies column four = 2 ÷ 10 or 20 percent. You can and should calculate the percentages of each column in the matrix in the same manner. Enter the figures in the bottom row of the matrix captioned percentage.

3. Percentage of teacher talk

Another interesting aspect of the matrix is that you are able to calculate the percentage of time the teacher is talking during the time of the total observation. As you recall, categories one through seven refer exclusively to teacher talk. In order to calculate the percentage of teacher talk to the total talk recorded in the matrix, add the sums of columns one through seven. In our example, this would be seven. Now, to calculate the percentage of teacher talk you must divide this total, 7, by the total number of tallies in the matrix, 10. The percentage of teacher talk equals 6÷10 or 70 percent.

It is also advisable to be able to analyze or break down this teacher talk into the different types of teacher statements. This is done by dividing the total of each category, one through seven, by the total of these seven categories. Suppose, in our example, you wanted to know what per cent of teacher talk was spent in accepting and clarifying pupil statements. You would ascertain the total of column three, one in our example, and divide this by the total of categories one through seven, which is seven. Therefore, one divided by seven equals 14.3 percent. This tells you that during the time the teacher was talking, he spent 14.3 percent of this time in accepting and clarifying pupil statements. You can carry out this procedure for each category, one through seven.

There is no place on the matrix to record this percentage analysis of teacher talk. However, in interpreting the matrix, you will find it advisable to make this analysis.

4. Percentage of pupil talk

Another aspect revealed by the matrix is the percentage of pupil talk. This is a very simple procedure since you merely add the totals of columns eight and nine and divide your new total by the total number of tallies in the matrix. Again let us look at our example in Table 6. You will see only one tally in column eight and no tallies in column nine; therefore, the total of columns eight and nine is one. You, then, just divide this total, one, by the total number of tallies in the matrix, 10, which equals 10. This tells you that during the time the observation was made of the classroom verbal interaction, the pupils talked 10 percent of the time. The percent of student talk is recorded in the space provided below the matrix.

You can now look back at your calculations and it is quite easy to ascertain a pattern of interaction which the teacher has used in this particular segment of his teaching.

5. Directness/indirectness of teacher talk

It is desirable to look at this pattern of interaction in yet another way to provide you or another teacher with information by which you may make judgments about your verbal behavior. You need to be able to determine the degree of directness or indirectness of the teacher talk or pattern. To determine this, you should total the number of tallies in columns one, two, three, and four. This total is divided by the total number of tallies in columns five, six, and seven. The result of this procedure will provide you with a ratio of indirect teacher statements to direct teacher statements. This is referred to as the ID Ratio. An ID Ratio of 1.0 simply means that for every indirect teacher statement there was one direct teacher statement; and ID Ratio of 3.0 means that for every three indirect teacher statements there was only one direct teacher statement. For discussion of the difference between direct and indirect statements, refer to page 131 of Session One.

6. Emphasis by teacher to motivation and control

Another more detailed analysis of the matrix can be done by calculating what is called a Revised ID Ratio. The results of this calculation reveals the kind of emphasis given by the teacher to motivation and control in a given classroom. The total of the tallies in columns one, two, and three is divided by the total of tallies in columns six and seven. As you can see we have eliminated categories four and five, asking questions and lecture, and focused on those categories which give evidence about whether the teacher is direct or indirect in his approach to motivation and control.

Please note that the Revised ID Ratio does not in any way indicate the presence or absence of motivation and control in the classroom. It merely gives you an idea of the methods used by the teacher in the situation observed to achieve motivation and control. Teacher statements recorded in categories 1, 2, and 3 are very indirect and serve to encourage students and develop an atmosphere of freedom in the classroom. Teacher statements recorded in categories 6 and 7 are very direct and serve to restrict or establish limits for student verbal behavior. Since the total of columns one, two, and three is divided by the total of columns six and seven, the Revised ID Ratio becomes an indication of methods employed by the teacher to achieve motivation and control. A Revised ID Ratio of less than 1.0 indicated that the teacher is somewhat direct or restrictive in an attempt to motivate and control the students. A ratio of more than 1.0 indicates that the teacher is more indirect in attempting to achieve motivation and control.

Summary

You were first exposed to the procedure for pairing the columns of numbers built up from recording the interaction of verbal behavior in the classroom.

These pairs, with each new pair overlapping the preceding pair, represent a specific cell in a matrix of ten rows and ten columns. A tally mark is placed on the matrix for each pair of numbers in the orginal sequence of data.

You were also introduced to the procedures for calculating the percent of teacher talk, the student talk, the ID Ratio, and the Revised ID Ratio.

Exercise

Figure 5 is a list of categorizations from a classroom observation. As a means of applying the foregoing information, plot the original data on the matrix on Figure 6 following the procedures described in this session. Make the analyses of the data that are called for on the matrix form. Refer to the context of Session Seven if you need to do so. The analyses are numbered in a sequential manner on the matrix form which corresponds to the numbers used when these analyses were discussed in the context.

If in placing the tally marks in particular cell you find there is inadequate space, simply continue to record the tallies in the margin of the matrix. Be sure to note the cell where they belong.

Do *not* look at Figure 7 until you have completed the plotting of the matrix (Figure 6) and have made the analyses of the data. When this is completed, check your results with the matrix on Figure 7. If your answers are not correct, go back and restudy Session Seven.

Don't forget to return to the objectives for Session Seven and make judgments regarding the extent of your achievement.

Figure 5

Categorization of Classroom Verbal Behavior

10	8	3	8	3	6	8
5	8	9	8	3	6	8
5	3	9	3	5	9	8
5	3	9	3	5	9	10
5	3	9	3	5	9	
5	5	9	5	6	9	
5	5	1	5	6	2	
5	5	1	5	6	3	
6	4	4	9	6	3	
6	4	4	9	10	3	
6	8	4	9	10	3	
6	8	8	9	10	5	
4	8	8	9	10	5	
4	2	8	9	10	5	
4	2	4	2	7	5	
8	3	4	2	7	4	
8	3	8	3	6	4	
8	3	8	3	6	4	
8	3	8	3	6	8	
8	3	8	3	6	8	

Figure 6

Blank Matrix for Session Seven

Name_____ **Date**_____

Situation_____

	1	2	3	4	5	6	7	8	9	10	
1											
2											
3											
4											
5											
6											
7											
8											
9											Matrix Total
10											
1. Total											
2. Column %											

3. Teacher Talk $\frac{\text{(Cols. 1-7)}}{}$ ÷ $\frac{}{\text{(Total Matrix tallies)}}$ **= % Teacher Talk**

4. Student Talk $\frac{\text{(Cols. 8-9)}}{}$ ÷ $\frac{}{\text{(Total Matrix tallies)}}$ **= % Pupil Talk**

5. Indirect (1-4) ÷ **Direct** (5-7) = **ID Ratio**

____ ÷ ____ = _____

6. Indirect (1-3) ÷ **Direct** (6-7) = **Revised ID Ratio**

____ ÷ ____ _____

Figure 7

Completed Matrix

(Session Seven)

	1	2	3	4	5	6	7	8	9	10	
1	1			1							
2		2	3								
3			17		4			1	2		
4				7				5			
5				2	15	2			1		
6				1		12			1	1	
7						1	1				
8		1	3	1				17		1	
9	1	2							12		
10							1			4	
1. Total	2	5	23	12	19	15	2	23	16	6	123
2. Column %	1.6	4.1	18.7	9.8	15.5	12.2	1.6	18.7	13.0	5.0	

3. Teacher Talk $\frac{78}{\text{(Cols. 1-7)}} \div \frac{123}{\text{(Total matrix tallies)}} =$ 63.4% Teacher Talk

4. Student Talk $\frac{39}{\text{(Cols. 8-9)}} \div \frac{123}{\text{(Total matrix tallies)}} =$ 31.6% Pupil Talk

5. Indirect (1-4) ÷ Direct (5-7) = ID Ratio

42 ÷ 36 = 1.17

6. Indirect (1-3) ÷ Direct (6-7) = Revised ID Ratio

30 ÷ 17 = 1.76

EIGHTH SESSION

Objectives

The following objectives are given as a guide for you in studying the eighth session. Look over the objectives carefully so that you will have a clear understanding of what is expected of you. After completing the eighth session, come back to these objectives and make judgments regarding the extent of your achievement. If you are not satisfied with your level of competence, go over the material in the eighth session again. Feel free to discuss this session with those persons who are studying interaction analysis with you.

1. Be able to identify and interpret the meaning of the "steady state cells."

2. Be able to identify and interpret the meaning of the transitional cells.

3. Be able to identify and interpret the meaning of the following areas of the matrix:
   a. content cross
   b. extended indirect influence
   c. extended direct influence
   d. teacher response to student talk
   e. student talk following teacher talk
   f. silence or confusion

4. Be able to associate general patterns of classroom interaction with given areas of a matrix.

Matrix Interpretation

You have now acquired sufficient skills in the use of interaction analysis to begin interpreting the matrix. As stated earlier in this package, you should be able to see a "picture" of the teaching behavior. You are to be introduced to areas and specific cells within the matrix that will provide you with sufficient information to actually see the patterns of interaction taking place. In essence, the information provided by the matrix is a summary of the teacher-pupil interaction data. As you recall, tallies are made in the matrix from observational data recorded during a teaching situation. Obviously, you are going to see a rather large build-up in some cells of the matrix with a scatter pattern in other cells of the matrix. You will be most concerned in observing those cells in the matrix which are rather heavily loaded with tallies.

In beginning to look at the matrix by general areas, let's first look at what are called the "steady state cells." You will find tallies in these cells only when the verbal behavior of either the teacher or pupils remain in a single category for longer than three seconds. These cells run along a diagonal line, as shown in Table 7, and are the only cells in the matrix that identify continuous talk in a single category.

If you will recall the procedure for categorizing, a category is recorded every three seconds. To record two fives in succession, a teacher must lecture for more than three seconds' duration. Since the orginial record of verbal behavior is plotted on the matrix in pairs, each pair overlapping the previous pair, tallies are recorded in steady-state cells only when the same category is used for two consecutive three-seconds periods; hence, the name steady-state cells.

All other cells are transitional, denoting movement from one category to another.

A large number of tallies in the steady state cells of columns 1 through 7 indicates that the teacher is being deliberate in communication, taking time to extend his ideas or those of the pupils. If pupils are being allowed to expand their ideas, you would expect to find a heavy loading of cells 8-8 and 9-9.

Now let us further break down the matrix into areas which permit a better description of the teacher-pupil interaction taking place. Table 8 indicates an area within the matrix which is called the "content cross." When you build or analyze a matrix that has a large number of tallies in this area, you may note that the teacher is placing a strong emphasis on content. Remember that tallies in the 4 and 5 categories are teacher statements that consist primarily of lecture, statements of information, ideas, and opinion, and teacher questions relative to information and content that he has presented.

While the emphasis in this session is on interpretation of the matrix by general areas, you should continue to think of specific cells at this time. For example, there are 34 cells in the content cross area. Each of these cells has a particular meaning in terms of the method being used by the teacher and the grade and achievement level of the students in the classroom. Tallies in the 5-5 cell indicate that the teacher has lectured for a period of time longer than three seconds. Tallies in the 8-4 cell indicate that a teacher has followed student talk with a question. Tallies in the 9-5 cell indicate that the teacher has followed student initiated talk with lecture. Each of the 34 cells may be interpreted in this way, while a concentration of tallies in the content cross indicates that the teacher is emphasizing course content for the situation observed.

The next area of the matrix that you should analyze indicates the extent that a teacher utilizes his indirect influence in the classroom interaction. Table 9 represents this area of the matrix and reveals the emphasis that the teacher gives to accepting and enlarging upon pupil feelings, category 1; to praising pupil behavior, category 2; and to using pupil ideas, extending and amplifying pupil statements, category 3. You should also note that this area of the matrix permits one to see transitions in teacher talk from one of the areas to the other. A heavy concentration of tallies in this area would indicate the use of extended indirect influence by the teacher. The emphasis here is on the word "extended." Another area of the matrix will indicate indirect influence. But, if the teacher accepts and extends student ideas for longer than three

Table 7

Steady State Cells

	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
Total										

Table 8

The "Content Cross" Area

	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
Total										

Table 9

Extended Indirect Influence

	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
Total										

Table 10

Extended Direct Influence

	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6						2				
7										
8										
9										
10										
Total										

Table 11

Teacher Response to Pupil Talk

	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
Total										

Table 12

Student Talk Following Teacher Talk

	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
Total										

seconds, it will be shown in the "extended" indirect influence area.

Before reading further, what do tallies in the 2-3 cell indicate? Obviously, they mean that the teacher has followed praise with an extension of student ideas. To remind you again, each of the nine cells adds meaning to an interpretation of the matrix. Remember, too, that loadings in the nine cells indicate extended indirect influence.

The opposite behavior of a teacher, extended direct influence, can be analyzed by observing the tallies in area 2 of Table 10. These cells of the matrix represent the emphasis by the teacher on criticism, lengthy directions, and/or moving from one of these types of influence to the other. In general, heavy tabulations in this area suggest a focus on the teacher's use of authority. One pattern of behavior familiar to most of us that is revealed in this area shows a teacher giving directions that are not followed. Generally, criticism follows the noncompliance with the directions and the teacher will either repeat the directions or give new directions. Such a sequence would place tallies in the 6-6, 6-7, 7-6 and 7-7 cells. A high frequency of tallies in this area would indicate that discipline problems characterize that particular situation or that students are rejecting the influence of the teacher.

Perhaps one of the most important aspects of teacher-pupil interaction is the manner in which a teacher responds to student statements. In Table 11, areas 3a, 3b, and 3c represent or reveal how a teacher reacts to pupil comments. You might consider asking yourself the following question, "What does the teacher do with pupil talk?" Area 3a represents indirect response by the teacher to pupil talk. This area would indicate that the teacher accepts pupil feelings, ideas, praises or amplifies pupil feelings and ideas in reacting to pupil responses. Area 3b would indicate that pupil talk was followed by teacher questions (8-4 or 9-4) or the teacher may simply have begun to lecture (8-5 or 9-5). Tallies in the area of 3c represent direct response to pupil talk in that the teacher has given directions (8-6 or 9-6) or he has followed the pupil talk with criticism or comments restricting the behavior of the pupils (8-7 or 9-7). The number of tallies in these three areas indicates the pattern of behavior used by the teacher in responding to pupil talk at the moment a pupil stops talking. In all cases of analyzing the matrix, you must view the different areas of the matrix in relationship to the number of tallies recorded in all other areas of the matrix. Now turn back to Table 9 and contrast these areas with the extended indirect influence area. Area 3a, 3b, and 3c are transitional and do *not* represent "extended" indirect influence.

Once again, you should consider specific cells. For example, contrast the meaning of the 8-7 cell with the 8-2 cell. Both indicate a way of responding to student talk, but they are vastly different. The 8-7 cell indicates criticism has followed student talk. The 8-2 cell indicates that praise has followed student talk. Look now at the 14 cells in these areas and consider and contrast the possible meaning of each of them.

In Table 12, areas 4a and 4b refer to the origination of pupil talk or responses. Area 4a indicates the kinds of statements the teacher uses to stimulate and/or initiate pupil talk. As an example, a heavy loading of tallies in the 4-8 cell would indicate that the teacher has used questions to initiate student talk. Tallies in the 5-9 cell indicate that the teacher's lecture has stimulated student initiated ideas. Basically, area 4a answers this question, "How does the teacher get students involved in classroom interaction?"

Area 4b reveals two distinct types of student talk--extended responses to teacher initiated ideas and extended talk about student initiated ideas. This area may indicate extended talk by one student or extended talk by several students. Once again, look at Table 12 and consider the meaning of each of the twenty cells in areas 4a and 4b.

You have learned that category 10 is used to record silence or confusion. Column 10 can be used to reveal the kind of teacher or pupil talk that is followed by silence or confusion. This is represented as shown by Table 13.

From the foregoing information, you should be able to analyze a matrix of classroom interaction and identify a pattern of classroom behavior. It is suggested that you build a matrix table like the one on Table 14 for further study of the different areas of the matrix.

To review what you have learned in session eight, study the completed matrix of a discussion in a high school social studies class in Table 15. First look at the steady state cells where there are sixty-six tallies. Which of the following statements is perhaps the best interpretation of these cells?

a. Forty-two tallies in columns 1-7 indicate that the teacher is very slow and deliberate in extending his ideas (5-5) and those of the students (3-3).

b. Sixty-one tallies in columns 1-9, when compared with the total of 164, is not necessarily high. Rather, other areas of the matrix indicate a rapid exchange of ideas with students participating freely.

Have you studied the matrix and made a choice? Probably choice "b" is more plausible than choice "a". But, why? First, 42 tallies do not represent a particularly heavy loading in columns 1-7 of steady state cells. There was probably little deliberation on the part of the teacher because cells 8-2, 8-3, 9-2, 9-3, and 9-4 indicate a rapid interchange of verbal behavior. Students were relatively free to interject their ideas which were accepted by the teacher.

Now look at the area of the content cross. Choose the most plausible of the statements below and interpret this area.

a. The 83 tallies in the content cross area are more than half of the total tallies. The teacher has emphasized content in the discussion.

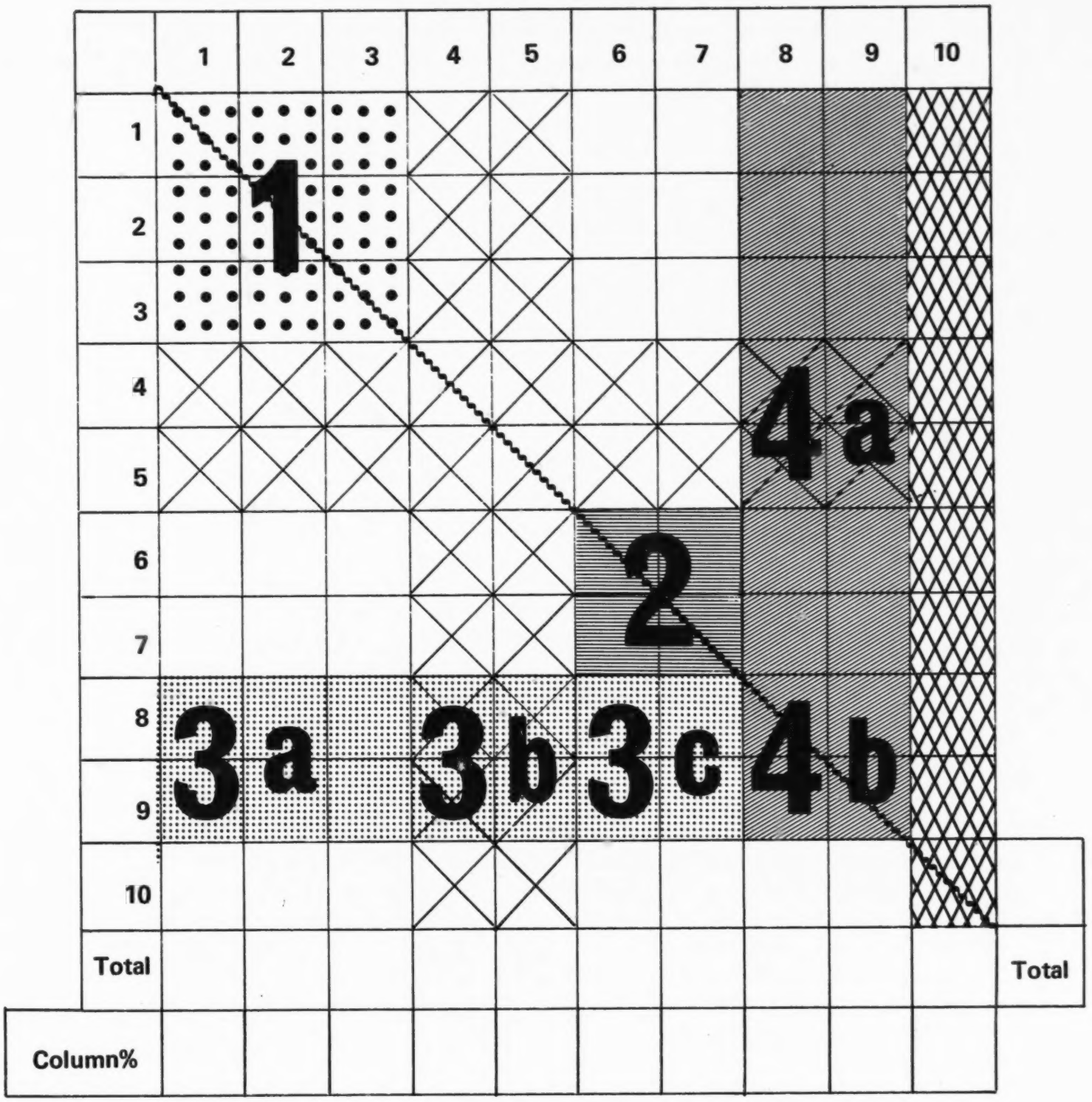
Table 13

Silence or Confusion

	1	2	3	4	5	6	7	8	9	10
1										● ● ● ● ● ● ● ● ●
2										● ● ● ● ● ● ● ● ●
3										● ● ● ● ● ● ● ● ●
4										● ● ● ● ● ● ● ● ●
5										● ● ● ● ● ● ● ● ●
6										● ● ● ● ● ● ● ● ●
7										● ● ● ● ● ● ● ● ●
8										● ● ● ● ● ● ● ● ●
9										● ● ● ● ● ● ● ● ●
10										● ● ● ● ● ● ● ● ●
Total										

Table 14

General Areas of Matrix



Content cross area

2. Teacher extended direct influence

4. 4a -- Teacher Statements to initiate pupil talk

4b -- Pupil extended or prolonged talk

Kind of teacher or pupil talk followed by silence or confusion

1.

Teacher extended indirect influence

3. 3a. -- Teacher indirect response to pupil talk

3b. -- Teacher questions or lecture in response to pupil talk

3c -- Teacher direct response to pupil talk

Steady state cells

Table 15

Completed Matrix

(Discussion lesson in a high school social studies class of average achievement)

	1	2	3	4	5	6	7	8	9	10	
1	2			1							
2			3	2			1	2	2	1	
3			8	5	6		1	2	2	1	
4				11		2		10	3	3	
5			1	4	18			2	5	1	
6						2				3	
7			1		1		1				
8		3	5		3	1		9	2		
9	1	2	7	5	2				10		
10				1	1		1		5	5	
Total	3	5	25	29	31	5	3	23	27	13	164
Column %	2%	3%	15%	18%	19%	3%	2%	14%	16%	8%	

Teacher Talk: $\frac{\text{101 (Cols. 1-7)}}{\text{164 (Total Tallies)}} = \frac{\text{62\% (\% Teacher Talk)}}{}$

Student Talk: $\frac{\text{50 (Cols. 8-9)}}{\text{164 (Total Tallies)}} = \frac{\text{30\% (\% Student Talk)}}{}$

ID Ratio: $\frac{\text{62 (Indirect Cols. 1-4)}}{\text{39 (Direct Cols. 5-7)}} = \underline{1.6}$ (ID Ratio)

Revised: $\frac{\text{33 (Indirect Cols. 1-3)}}{\text{8 (Direct Cols. 6-7)}} = \underline{4.1}$ (Revised ID Ratio

b. Though half of the total tallies are in the content cross area, other cell loadings indicate that the teacher has attempted to draw comments from students and has used content as the vehicle to do this.

Remember that you were advised in the seventh session to study particular areas and cells of the matrix in relation to loadings in other cells. The content cross area does contain half of the total tallies. Yet students have felt free to contribute to the activities taking place. Even the teacher lecture has stimulated student comments as indicated by the 5-9 cell. Content has been emphasized, but probably as a vehicle to stimulate student talk. Therefore, choice "b" is perhaps the most plausible.

Now look at the extended indirect influence area of the matrix and choose among the statements below:

a. The teacher was acceptive of student talk, but it was a short acceptance with the teacher moving quickly to additional questions or lecture.

b. The eight tallies in cell 3-3 do represent substantial acceptance and extension of student ideas.

Once again you must look at other areas of the matrix in choosing the statement that is the most plausible. The teacher was acceptive of student ideas for this situation, but the acceptance was probably very short (8-3 and 9-3). Note, for example, the tallies in cells 3-4 and 3-5. The teacher moved quickly from acceptance to further questions and lecture. Therefore, choice "a" is perhaps the most plausible.

The extended direct influence area contains only three tallies. Obviously the teacher is not experiencing discipline problems nor are the students resisting his influence.

Now study areas 3a, 3b, and 3c of the matrix. How does this teacher tend to respond to student talk?

a. The teacher responds in a very indirect manner to student comments.

b. The teacher responds in a very direct manner to student comments.

There is only one tally (8-6 cell) that would indicate that the teacher responds in a direct manner to student talk. The five tallies in 8-5 and 9-5 indicate that the teacher does follow student talk at times with lecture. Most of the time he either accepts or praises. This finding is consistent with the ID Ratio of 1.6 to one. Therefore, choice "a" is probably the most plausible.

Now let's consider one last area of the matrix. What technique has the teacher used to stimulate student talk? Study areas 4a and 4b of the matrix and choose from the statements below.

a. In this lesson the teacher has largely used questions to stimulate student talk.

b. In this lesson the teacher has largely stimulated student talk through lecture.

The matrix indicates that some student talk is stimulated by the teacher's lecture and by his acceptance and extension of student ideas. By far the most used method, however, is questions. Note the 13 tallies in the 4-8 and 4-9 cells. Note further in area 4b that students feel free to extend their talk as indicated by the 19 tallies in the 8-8 and 9-9 cells. Moreover, some of the questions may have been very general, requiring thought by the students. This may explain the three tallies in cell 4-10.

Why not go back to the objectives for Session Eight and estimate the extent of your achievement. If you are not satisified, review the text for this session.

NINTH SESSION

Objectives

The following objectives are given as a guide for you in studying the ninth session. Look over the objectives carefully so that you will have a clear understanding of what is expected of you. After completing the ninth session, come back to these objectives and make judgments regarding the extent of your achievement. If you are not satisfied with your level of competence, go over the material in the ninth session again. Feel free to discuss this session with those persons who are studying interaction analysis with you.

1. Be able to identify and discuss patterns or models of verbal behavior as recorded on a matrix.

2. Be able to make four or five descriptive statements about the verbal behavior that is "pictured" on any given matrix.

Interpreting the Matrix by Using Models

You should now be able to analyze your verbal behavior in the classroom by making a record of this behavior with the Flanders System of Interaction Analysis, plotting the matrix, and then interpreting the matrix. As suggested in the last session, you should do this by thinking in terms of specific cells that are heavily loaded for any particular situation. Each of these specific cells adds meaning to the interpretation of the matrix in terms of the subject matter being taught and the ability and achievement levels of the students involved. This interpretation is one of the most useful aspects of the system. *But have you noticed that a pattern or model of verbal behavior can be seen on the matrix as you relate all of the heavily loaded cells?* It is the purpose of this session to suggest how the verbal behavior in the classroom might be viewed from this broader perspective.

For example, let's think of what might be called a typical drill lesson in reviewing for an objective test that is soon to be given. As such, short questions by the teacher

which call for short responses by the students will most likely characterize the session. The answers of the students will be in response to ideas initiated by the teacher in the questions. The questions should be recorded as 4's and the student responses as 8's. If you will now recall your experience in plotting the matrix, you can readily understand that a model or pattern will be similar to that on the matrix Table 16.

Needless to say, in most every classroom session, including drill lessons, the teacher does some lecturing and some accepting of students ideas. But for purposes of illustration, this has been ignored in this model.

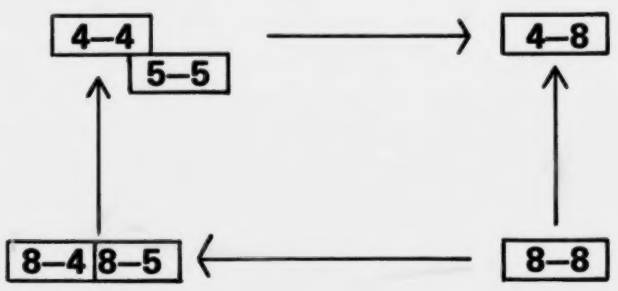
To review this example, the original data would probably be a 4, 8, 4, 8, 4, 8 sequence. Since these data are recorded in pairs, with each pair overlapping the previous pairs, no more than three cells would be used. They are the 4-4, 4-8, and 8-4 cells. Notice also that there is a circularity to this model as shown on the matrix. This circularity will characterize all patterns of verbal behavior in the classroom.

Let's look at another example. Suppose that in the drill lesson described earlier, the type of questions were changed from short, factual ones to broad, open-ended questions which require careful thought by the students in answering. To expand this further, assume that the teacher began with a short lecture, followed this with broad, open-ended questions; the students gave lengthy responses and the teacher questioned or lectured again. The original data would probably be a 5, 5, 5, 4, 4, 4, 8, 8, 8, 4, 4 sequence. Plotting the overlapping pairs on the matrix would produce the pattern or model on Table 17.

Notice once again that the pattern or model takes on a circular arrangement. At this point it may also be wise to compare this model with the drill pattern in the first example. If you will recall, the only significant change in verbal behavior was the type of questions asked by the teacher, but it represents quite a change in the model that results.

Moreover, it is not necessary that the model be shown on the matrix. It is a simple matter to show the model graphically by identifying the cells that are heavily loaded and using arrows to denote the flow of verbal behavior in the manner shown below:

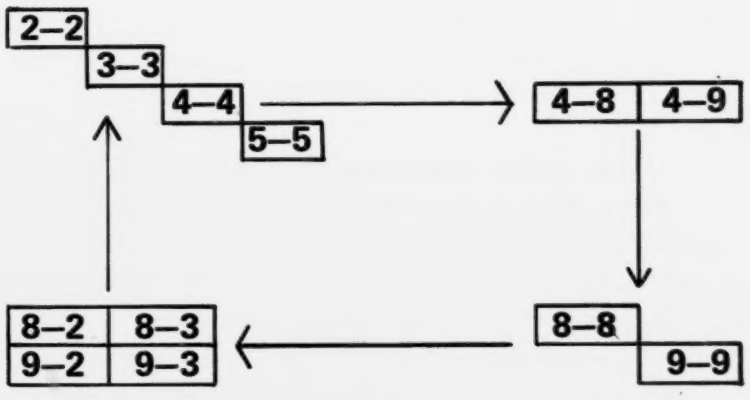
Model 1



If you do choose to discard the matrix, make sure that you show the cells of the model in their relative positions on the matrix.

Now let's further change the model in one final example. Assume that students interject their own ideas in answering the questions. Assume further that the teacher is very acceptive of the student responses to the open-ended questions used in the example above by praising and extending the ideas, thus using categories two and three. Think now how this change would be reflected in the model.

Model 2



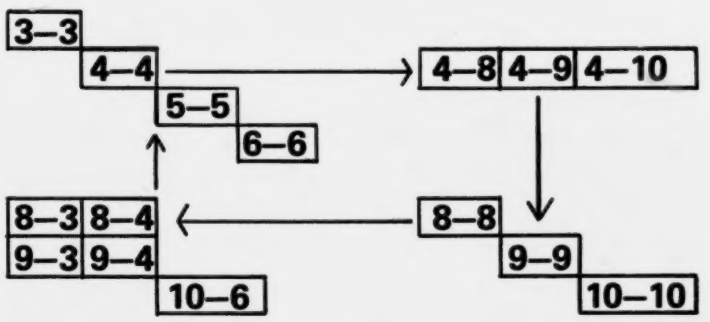
Once again there is a circularity to this model that may be repeated over and over again during the course of a discussion lesson like that described above.

Now let's look at a completed matrix of a discovery type lesson in a math class at the junior high school level.

Study the matrix, Table 18, carefully and, on a separate sheet of paper, construct a model that you feel represents the verbal model of this lesson. Include arrows to indicate the direction of the pattern. Remember to use those cells which are heavily loaded and, therefore, are significant in interpreting the lessons. Do not read further until you have done this.

Now compare the model that you have constructed with that shown below:

Model 3



Now let's further consider the completed matrix in Table 18 and the model that you have just constructed. Keeping in mind the fact that this is a discovery-type lesson, what meaning can you attach to specific cells? You may approach this by asking yourself questions of the following types.

Table 16

Model of a Drill Lesson

	1	2	3	4	5	6	7	8	9	10	
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
Total											
Column %											

Table 17

Discussion Lesson with Open-ended Questions

	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
Total										
Column %										

Table 18

Discovery Lesson

Junior High School Math Lesson

	1	2	3	4	5	6	7	8	9	10	
1			1								
2				2	1	1			1	1	
3		3	10	3				1	1		
4				12				5	9	5	
5				2	24	2				2	
6		2				18	1	1	2	3	
7				2			2		1	1	
8	1		4	3	1	1	1	10			
9		1	3	7	1		2	4	12		
10					3	5			4	18	
Total	1	6	18	31	30	27	6	21	30	30	200
Column %	.5%	3%	9%	15%	15%	14%	3%	10%	15%	15%	

Teacher Talk	119 (Cols. 1-7)	÷	200 (Total Tallies)	=	60%
Student Talk	51 (Cols. 8-9)	÷	200 (Total Tallies)	=	25%
ID Ratio	56 (Cols. 1-4)	÷	63 (Cols. 5-7)	=	.89 to 1
Revised ID Ratio	25 (Cols. 1-3)	÷	33 (Cols. 6-7)	=	.76 to 1

For example, *do you feel that the teacher did too much of the talking during the period of time covered by this matrix?* As you think about this question, keep in mind that it is a discovery-type lesson in a math class. Look now at specific cells on the matrix for clues in possibly answering the question before you read further.

Did you note the twenty-four tallies in cell 5-5 and the eighteen tallies in cell 6-6? These two cells represent 35 per cent of the teacher talk. Now choose from among the following as possible explanations:

a. The teacher may be experiencing discipline problems and has resorted to giving factual information and directions to establish order.

b. The lecture and directions were offered as background for what is to follow.

c. The teacher is highly directive and content centered because of the proportionate number of tallies in the content cross.

If you chose "b" you are probably correct. If the teacher were experiencing discipline problems as indicated in choice "a", there would probably be more tallies in the 7 column and especially cells 6-7 and 7-6 indicating a pattern of directions, a lack of compliance by the students, threats and redirections by the teacher. Choice "c" is probably not correct because the content cross is *not* particularly loaded with tallies. Rather, there is a significant scatter pattern all over the matrix.

Why then is choice "b" the best answer? In a discovery-type lesson it is very important that the teacher build a background or foundation from which the students can work. This probably accounts for the loadings in the 5-5 and 6-6 cells. Note now that you have an objective basis for judging whether the teacher did too much of the talking.

Let's consider a further question. *How does this teacher tend to react or respond to student talk?* Once again look at the total matrix and the model that you have constructed for specific cells that may provide clues in answering the question. Do not read further until you have studied the matrix, making a mental note of the cells which seem to bear some influence.

Did you perhaps choose rows 8 and 9, with emphasis on columns 1, 2, 3, 4, 5, 6, and 7? This area of the matrix does give clues on which you may answer the question. Now look at the matrix again and decide which of the following statements best fit the situation.

a. The teacher most frequently responds to student talk with criticism and uses this method to redirect student thinking.

b. The teacher most frequently follows student talk with lecture, probably to provide more clues by which the student can improve his answer.

c. The teacher most frequently follows student comments with questions that are probably used to help the student further probe and defend his point of view.

Choice "c" is most likely correct. Choice "a" is not correct because there are only three tallies in the 8-7 and 9-7 cells. The teacher was not generally critical of student talk. Choice "b" is not correct because there are only two tallies in the 8-5 and 9-5 cells. The teacher did lecture considerably during this situation, but he did not do this following student talk.

Then why is choice "c" correct? First, there are ten tallies in the 8-4 and 9-4 cells. This even exceeds the seven tallies in the 8-3 and 9-3 cells. During the period of time covered by this matrix, the teacher most frequently followed student talk with additional questions. The questions were probably used for probing as indicated by the twelve tallies in cell 4-4. The second most frequent response of the teacher to student talk is accepting and extending ideas. Now, do you feel that this pattern fits a discovery-type lesson? It probably does.

There are two other interesting facts that can be observed by studying this part of the matrix. The ID Ratio of .89 to 1 indicates that the teacher has been more direct than indirect for the duration of this situation. Yet, if you were to look at the way he responds to student talk, he is much more indirect than direct, with an emphasis on extending student ideas and further questioning. Secondly, he responds about the same way to teacher-solicited responses (8's) as he does to student-initiated responses.

Now to move on to another question. *Do you think that the students tend to resist the influence of the teacher?* Once again, look for specific cells on the completed matrix that may help you decide on an answer before reading further.

Did you consider the possible implications of the 6-7, 7-6, 6-6, 7-7 cells? Or what about the eighteen tallies in the 10-10 cell? Choose one of the following explanations as you further study the matrix:

a. The eighteen tallies in the 6-6 cell and the same number in the 10-10 cell indicate that students are resisting the influence of the teacher. He has become very directive (6-6) and the students resist, causing confusion (10-10).

b. A discovery-type lesson requires that the teacher give directions on how the class is to proceed. The tallies in the 10-10 cell really represent silence as the students think about the questions asked of them.

Choice "a" does not seem to be consistent with the data revealed by the matrix. Discipline problems are more likely indicated by tallies in the 6-7, 7-6, and 7-7 cells. These cells are loaded when the teacher gives directions, the students resist this influence, the teacher criticizes and

redirects. Tallies in the 4-10, 6-10, and 7-10 cells also indicate resistance to teacher influence by the students, but there are few tallies in these cells of the matrix.

Choice "b" is probably the best answer. In a discovery-type lesson, the teacher needs to give directions on how the class is to proceed. Also, if the questions are open-ended, students probably will think considerably before speaking, resulting in a number of tens being recorded by the observer.

How effectively did the teacher use praise in this situation? Once again, examine specific cells on the completed matrix for possible answers to this question. After examining the matrix, choose one of the following as the best answer to the question:

a. The teacher frequently praised the verbal comments of students.

b. The teacher used a limited amount of praise but it did not follow the comments of students.

c. The praise used by the teacher frequently generated additional student comments.

Have you reached a decision? Choice "b" is probably the most interpretation of the use of praise in this situation. First, why do choices "a" and "c" lack plausibility? Look at choice "a" again and then refer to the matrix. Only once (9-2 cell) did the teacher follow a student comment with praise. This is hardly a frequent use of praise following student comments.

Choice "c" lacks plausibility because only once (2-9 cell) did a student comment following praise by the teacher. Rather, the teacher's most frequent use of praise followed an acceptance of the student idea and following directions. Praise did not directly follow student comments.

Perhaps the most effective use of praise would have resulted in more student comments following praise, especially in a discovery-type lesson. Yet you cannot ignore the fact that students did feel free to comment as indicated by the tallies in 4-8, 4-9, 8-8, and 9-9. While praise, at least for this situation, did not generate student talk, questions did. An atmosphere of freedom seemed to prevail.

By no means does this exhaust the list of questions that may be asked about the verbal interaction in a classroom. These questions are representative. In analyzing matrices of your own classroom you may want to add these questions to the list:

1. How do students respond to my criticism?

2. Is there adequate participation by the students in my classroom?

3. What techniques do I generally use in communicating subject matter to my students?

4. Do I accept and make use of ideas that are initiated by students?

5. Do I capitalize on student emotion that is expressed in my classroom?

As you develop your skill in interpretation you will find that the matrix reveals insights to these and many other questions that may be appropriately asked. Although there can be no absolute answers, understanding the verbal behavior in your classroom with possible effects on student achievement and attitudes may be of great value to you as a classroom teacher.

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APPENDIX A

EVALUATION INSTRUMENT

EVALUATION INSTRUMENT

Directions: Answer the following multiple choice items by putting a letter on the line at the left.

_____ 1. Which of the following statements best represents the purpose of interaction analysis?

a. To provide insights into the personality problems of students.
b. To aid the teacher in studying and evaluating his own classroom behavior.
c. To aid the teacher in understanding how students learn.
d. To aid the teacher in planning daily assignments.

_____ 2. One of the major points made in the introduction is:

a. Teachers need to know more about how students learn.
b. Teachers frequently do not understand students.
c. There is a great need to study the act of teaching in its natural habitat.
d. To improve teacher effectiveness, greater emphasis should be given to a knowledge of subject matter.

_____ 3. Interaction Analysis is designed to:

a. Evaluate the effectiveness of a teacher.
b. Be used as an inservice education device for teachers.
c. Provide feedback to a principal or supervisor.
d. Measure pupil achievement.

_____ 4. In recording the verbal behavior in a classroom one should decide which of the ten categories represents the verbal interchange taking place and make a notation of this every:

a. Five seconds
b. Twenty seconds
c. Ten seconds
d. Three seconds

_____ 5. Facts that should be recorded prior to making an interaction analysis observation are:

a. Subject area
b. Grade level
c. Ability and achievement levels of class
d. All of the above

_____ 6. If more than one type of verbal activity occurs during the designated recording period, one should:

a. Disregard the change
b. Continue recording at the same tempo
c. Record each change of verbal activity regardless of the frequency
d. None of the above

_____ 7. As an observer records verbal interchange, he must ask himself:

a. What is the teacher attempting to do?
b. How does this relate to the content?
c. What effect does the teacher's statement have on the student?
d. How does this relate to the teachers' lesson plan?

_____ 8. Which of the following types of activity is not appropriate for interaction analysis?

a. Discussion
b. Lecture
c. Workbook assignments
d. All of the above

_____ 9. The manual suggests that the original recording of classroom verbal interaction be done in:

a. Rows of twenty numbers
b. Columns of twenty numbers
c. Rows of thirty numbers
d. Columns of thirty numbers

_____ 10. The matrix used with interaction analysis is

a. A grid with twenty rows and twenty columns
b. A grid with fifteen rows and ten columns
c. A grid with ten rows and five columns
d. A grid with ten rows and two columns

_____ 11. How many different cells are contained in the matrix?

a. 100
b. 75
c. 50
d. 25

_____ 12. The ID Ratio reveals for the data plotted in the matrix:

a. The number of new ideas presented
b. The percentage of student talk
c. Whether the teacher was direct and indirect
d. The percentage of teacher talk

_____ 13. The Revised ID Ratio reveals for the data plotted in the matrix:

a. The method of motivation and control used
b. Whether the teacher is direct or indirect
c. The number of new ideas presented
d. The ratio of silence to teacher talk

_____ 14. What are the major divisions of teacher-talk as classified by the Flanders System?

a. _____
b. _____

_____ 15. What are the major divisions of student-talk as classified by the Flanders System?

a. _____
b. _____

Directions: Classify the following statements by writing the Flanders category code number on the line to the left:

_____ 16. "That's good, Joan."
_____ 17. "Open your books to page 39."
_____ 18. "How would you define the word 'highway'?"
_____ 19. "No, that's not quite right."
_____ 20. "Mark Twain was the pen name of Samuel Clemens."
_____ 21. "I understand how you feel, Betty."
_____ 22. "What is your impression, John?"
_____ 23. "John has stated that Charleston is the capital of West Virginia."
_____ 24. "Spiro is the vice-president's first name."
_____ 25. "Sit down, Joe."

Directions: Please respond to the following by writing true or false on the line to the left of each item:

_____ 26. Jokes by the teacher are recorded as 5's.
_____ 27. Directions by the teacher are recorded as 6's.
_____ 28. All classroom activities are appropriate for categorizing.
_____ 29. Questions initiated by students are recorded as 4's.
_____ 30. Teacher acceptance of pupil ideas is recorded as a 3.
_____ 31. All statements by the teacher that restrict student behavior are recorded as 9's.
_____ 32. All teacher statements that praise or encourage student responses are recorded as 2's.
_____ 33. Categories representing the verbal interaction are recorded on the matrix in pairs.
_____ 34. The total number of tallies recorded on the matrix should be one more than the total numbers entered on the original observation record.
_____ 35. Each matrix should represent only one type of classroom activity; e.g., lecture, discussion, etc.

Directions: Match the following terms with their appropriate definition or description given in List A:

_____ 36. Steady state cells
_____ 37. Column ten
_____ 38. Extended *direct* influence area
_____ 39. Content cross
_____ 40. Transitional cells
_____ 41. Teacher response to student talk area
_____ 42. Student talks following teacher talk area
_____ 43. Extended *indirect* influence area

LIST A

A. All cells denoting movement from one category to another.

B. Identified by a heavy concentration of talking in rows 4 and 5 and columns 4 and 5.

C. Cells that run along a diagonal line of the matrix that indicate sustained talk in a single category.

D. Reveals the ratio of indirect to direct influence.

E. That area of the matrix which includes rows 1, 2, and 3 and columns 1, 2, and 3.

F. Reveals the type of teacher or pupil talk that is followed by silence or confusion.

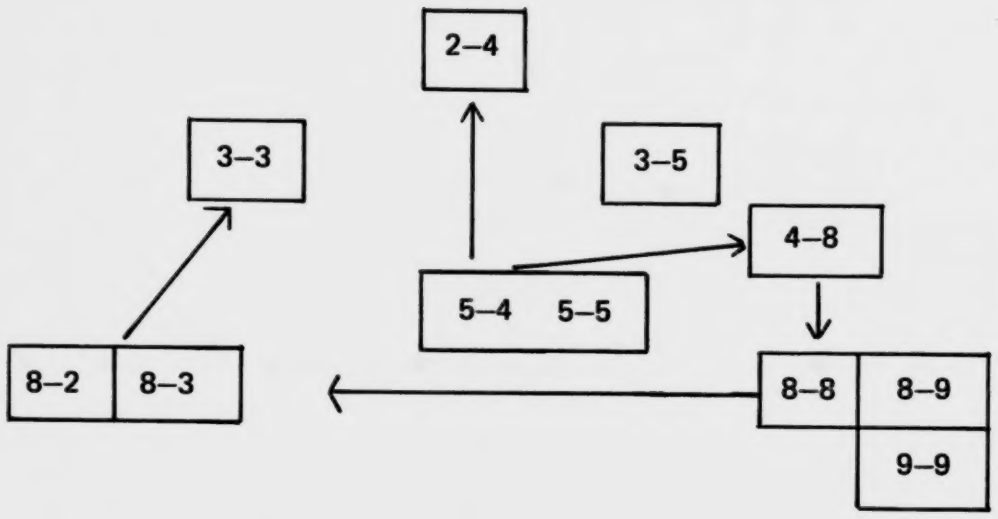
G. Reveals ratio of teacher talk to student talk.

H. Area of matrix enclosed by rows 8 and 9 through columns 1 through 7.

I. Focuses on the teacher's use of authority.

J. Found by inspecting columns 8 and 9.

TEACHING MODEL



44. Write four or five short statements that describe the type of verbal interaction that you feel is indicated by the model shown above. Try to be brief and to the point.